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SCIENCE

Galion T-700 motor grader

Michigan 175A turbocharged tractor-shovel

Worthington
Blue Brute 600 compressor

JANUARY 1956

Contractors and Engineers

magazine of modern construction

Buffalo-Springfield K-45 Kompactor

Product Parade for 1956

Pioneer Vibromatic bituminous paver

Wooldridge M-R-S OS-300B scraper unit

see page 19

Building Good Roads

with low-cost gravel and Texaco Asphalt

Photographs

1. Road-mixing machine picks up gravel from windrow, blends it uniformly with Texaco Slow-curing Asphaltic Oil and deposits mix in another windrow.

2. A power grader is used to spread the asphalt-gravel mix over the full width of the road to the desired thickness.

3. Multi-wheel rollers, as well as a conventional steel wheel roller, were used to compact the Texaco Asphalt wearing surface.

4. Completed Todd County road illustrates results obtainable with low-cost gravel and Texaco Asphaltic products.

CONTRACTOR . . . Roland M. Starry, Long Prairie, Minn.

Any county or municipality favored with an ample supply of local gravel can build good roads at low cost by following the example of Todd County, Minn.

In the road project illustrated above, Todd County used inexpensive gravel both as a base and as the aggregate in a road-mix type of Texaco Asphalt wearing surface. The result is a highway capable of serving fairly heavy traffic for years, with an occasional bituminous seal coat.

The waterbound gravel base was laid in two courses to a compacted thickness of 4 to 6 inches. Following this, Texaco Slow-curing Asphaltic Oil and gravel were blended uniformly on the base by mechanical mixer, spread by power grader and compacted to form a tough, waterproof surface 1½ inches thick.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils have provided a wide range of answers to the road building problem for half a century. Helpful information on all types of asphalt road and street improvements, from heavy-duty paving to dust laying, is supplied in two free booklets. Copies can be obtained without obligation by writing our nearest office.

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TEXACO REG. T. M.

TEXACO ASPHALT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 201

Contractors and Engineers

magazine of modern construction

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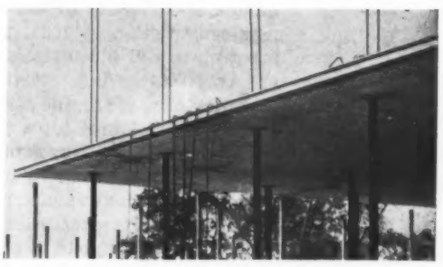
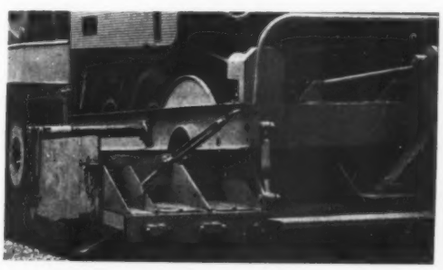


Jacking precast floor units into place. Pg. 122



Paver attachment bevels road edge. Pg. 132

Gas pipeline coated and bent at central yard. Pg. 62

Newest equipment passes in review. Pg. 19

editorial

Looks like a good year ahead

Last January, our man with the crystal ball conservatively predicted that the construction industry would handle about $39½ billion worth of new construction in 1955. The summing up is still incomplete, but government sources indicate that when all the returns are in, the construction volume for 1955 may hit a $42 billion peak. The same sources expect a new record high of $44 billion to be reached this year. New highways, schools, and sewer and water facilities are expected to lead the field in public construction. See page 5 in this issue for details on what to expect in 1956.

To prepare for this great volume, contractors, material suppliers, government agencies, and other users of construction machinery might immediately consider their equipment needs for 1956. Even though job awards are distributed throughout the year and contractors cannot possibly foretell what their exact volume of work will be in the months ahead, they would be wise to consider closing at once any gaps in their equipment inventory.

Early action will give purchasers time to analyze and choose the best equipment available for both their long and short-time projects, and to decide on the most economical means of financing and amortization. Such early buying also insures that manufacturers' factory experts will be available for assembling, erecting, and checking new units, while the users' operators can break in machines and become familiar with the equipment before it is assigned to high-production job schedules. A safe break-in period, moreover, will result in time and money savings to the new owner.

It seems hardly necessary to add that in purchasing construction supplies and materials, no real gain will result in bypassing the distributor and going directly to the manufacturer in the hope of getting a lower quotation. While this might seem cheaper, say with a large order for one particular project, the purchaser is overlooking the service that only a distributor can render. Estimate first what this service is worth in hard cash, then add the figure to the so-called low quotation and see if the resulting sum is a bargain. In figuring the distributor's service, don't overlook such intangibles as his availability to supply quickly the multitude of items a large construction project demands. The distributor might well be considered the agent for numerous construction firms who pay a small fraction of the cost of an item for such specialized service.

In selecting equipment and materials for this big construction program, potential purchasers will benefit by a careful scrutiny of our Product Parade section. Starting on page 19, it presents the latest machines and supplies now on the market for the coming construction season.

This month, as throughout the new year, construction men may be aided by our regular features: Avoid Legal Pitfalls, page 106; Weather Charts, page 170; Surveying Washington, page 174; a new series on construction management, starting on page 68; and the many illustrated, detailed, staff-written articles on varied construction projects. Last but not least are the wealth of big display advertisements that really speak for themselves.

This month's cover introduces the big January Parade of Products with which CONTRACTORS AND ENGINEERS salutes the new construction year. Beginning on page 19, you'll find a whole section devoted to the newest equipment—machinery and materials—available to help contractors do the big jobs speedily and at a good profit. The line of march includes not only the major items announced during the year just past, but many brand-new products as well. Some of the outstanding entries are pictured on the cover, along with Art Director Henry Salloch's pen-and-ink impression of our Product Parade.

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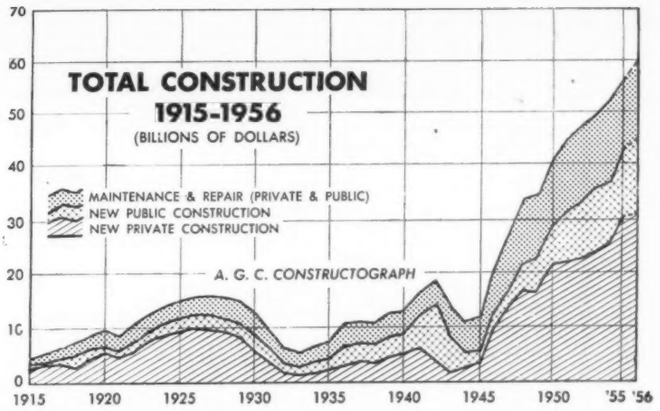
Prosperity spurs construction toward another record year

by FRANK KYPREOS
Research Director



Construction's sustained rise has been a phenomenon of the post-war American economy. Source: A.G.C. and Departments of Commerce and Labor.

Significant news for the construction industry was made at the annual meeting of the National Association of Manufacturers last month, when 2,000 industrialists expressed some rather optimistic opinions about the nation's immediate economic future. It developed that although latest figures from government agencies have recently shown growing inventories and fewer new orders than expected, by and large business is in a good position on both counts to expand its sales by 10 to 15 per cent early in 1956. Expected sales gains may well continue through the year.

Prosperity stimulates demand

In more than one way this was strong confirmation of predictions that demand for new construction will be heavy this year, possibly setting records in some fields. In the first place, business expectations will directly influence construction activity through orders for industrial and commercial buildings. As of now industry plans to spend over 31 billion dollars for new plants and equipment in 1956. Analogously, construction anticipates a sharp rise in contracts for industrial plants and may well do as much as 17 per cent more business in this field during 1956, according to the U. S. Department of Commerce. Warehouse, office, and retail store building will also quicken in pace.

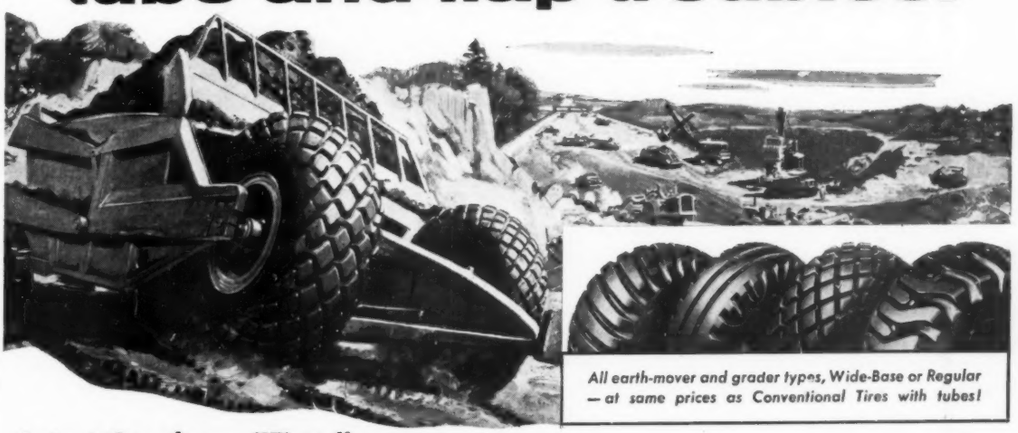
Indirectly, business prosperity stimulates almost every type of construction, both public and private. Federal economists, partly, at least, on the basis of their expectations for the economy as a whole, have predicted a 5 per cent over-all rise in spending for new construction in 1956. That would bring the new record amount to $44 billion as against the $42 billion peak of 1955.

Big highway market

Contract awards tabulated by F. W. Dodge Corp. have led these construction-statistics specialists to predict a rise of 13 per cent in 1956 spending for public works and utilities construction. This includes highway building, which can just about be counted on to spearhead future increases in the total volume of construction. This year, the Bureau of Public Roads estimates $4.6 billion will be spent for new highways as against $4.1 billion in 1955. The expected gain is 12 per cent. Counting right-of-way costs, the 1956 investment would be $5.3 billion. Total highway spending, including maintenance, is likely to approach $8 billion, or 10 per cent more than the estimated 1955 sum of $7.2 billion. Future programs seem certain to be even bigger.

(*Continued on next page*)

End earth-mover tube and flap troubles!



Latest Goodyear "Firsts"—

TUBELESS TIRES Built with 3-T NYLON CORD plus EASY-MOUNTING TRU-SEAL RIMS

eliminate major causes of down time on all earth-mover and grader vehicles!

If you're wondering whether giant-size tubeless tires can be safely mounted—whether they really *hold* air—whether their savings in cash, time and trouble make them worth-while—GOODYEAR HAS THE PROVED ANSWERS!

Proof one—on actual commercial operations and construction jobs of all kinds, no serious tire or rim trouble has been reported!

Proof galore—unconditionally enthusiastic reports from independent operators add up to this:

NO MORE EXPENSIVE DOWN TIME because of tube and flap trouble!

NO MORE EXPENSIVE TUBE REPLACEMENT—a big factor on many jobs where tires outlast 2 or 3 tubes!

FASTER, EASIER MOUNTING AND DISMOUNTING—no more double inflation, no more tubes and flaps to handle—NO complicated mounting methods to learn!

TRULY AIRTIGHT ASSEMBLY—Goodyear's exclusive 3-T NYLON CORD forms an airtight chamber—and Tru-Seal rims *hermetically seal* the assembly!

COOLER RUNNING than conventional assemblies—means greater safety, longer tire life!

SLOW LEAKS INSTEAD OF BLOWOUTS—small, unnoticed injuries lead to blowouts in conventional tires. In Goodyear tubeless earth-mover tires, they may be detected and repaired *before* costly, dangerous damage!

SIMPLER, RE-USABLE VALVE-PARTS—Goodyear's tubeless valve program means fewer parts to stock, lower cost parts that can be used over and over again!

Leading equipment manufacturers are going Goodyear tubeless—with Tru-Seal rims. Specify them in the new wide-base or conventional cross sections and say goodbye to tube and flap troubles forever!

Goodyear, Truck Tire Dept., Akron 16, Ohio.

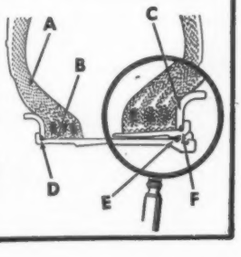
How Goodyear Engineering assures Quick, Airtight, Tubeless Assemblies:

(A) 3-T NYLON CORD plies prevent air-seepage through tire.

(B) Same 5° taper bead-base hugs Tru-Seal rim.

(C) Tru-Seal rim employs same general mounting principles as conventional rims.

(D, E, F) Tru-Seal rubber rings press into locking grooves, hermetically seal entire assembly—*automatically!*



GOODYEAR TIRES

Look for this sign; there's a Goodyear dealer near you.

Buy and Specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND!

Tru-Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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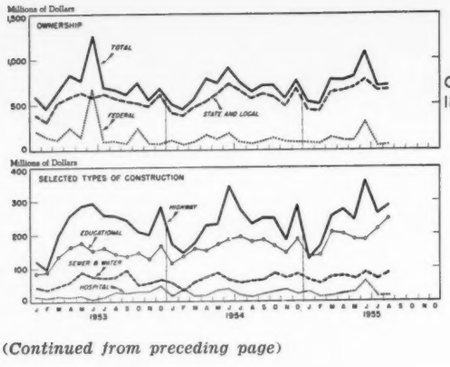


Contracts awarded on public construction.

(*Continued from preceding page*)

Other gains

This year will also see an attempt to make up for some of the big deficiencies in schools and in sewer and water facilities. Spending for these purposes will probably go up 10 and 11 per cent respectively. Together with highways, these categories account for three-quarters of the predicted rise in public-works spending.

Other gains are scattered throughout the roster of types of work done by the construction industry. Churches, social and recreational buildings, railroad and telegraph facilities, pipelines, and military installations will all constitute bigger markets for construction this year than last. The one sizable area of construction not expected to increase its business next year is home building. The Department of Commerce estimates a 3 per cent drop in dollar volume reflected in about 100,000 fewer housing starts than in 1955.

Industry comment

Because of the role that construction continues to play as a mainstay of the economy, it has come in for considerable discussion both in and out of the industry. Comment from within the ranks of construction has tended to focus on the highway program. This is natural enough since some time in the first half of 1956 the level of federal participation in future roadbuilding will be set down in law by Congress. The outcome of present debate, therefore, will go far to determine activity levels in the construction industry for perhaps the next decade.

Generally, highway contractors seem to feel that the present climate of opinion is such that Congressional action this year will be favorable. J. N. Robertson, President of the American Road Builders' Association, foresees "a number of developments that are bound to make 1956 a year of importance. . . . The major issue affecting the highway industry will be . . . . consideration by Congress of . . . . a greatly expanded national roadbuilding program . . . (Last year's) legislative defeat has in no way slowed the push for a huge federally-inspired . . . program. . . ."

"1956 will break all previous records in new road construction. There will be a step-up in planning, programming, and construction of urban projects, including a number of long needed expressways . . . (but) availability of highly-trained engineers will continue to be a problem . . . (although) State and local highway departments will become more resourceful than ever in finding solutions . . . Competition, now at a keen edge, will continue to hold road construction prices down . . . Many public officials are getting more bids per project than ever before, with often a dozen contractors competing for work. . . ."

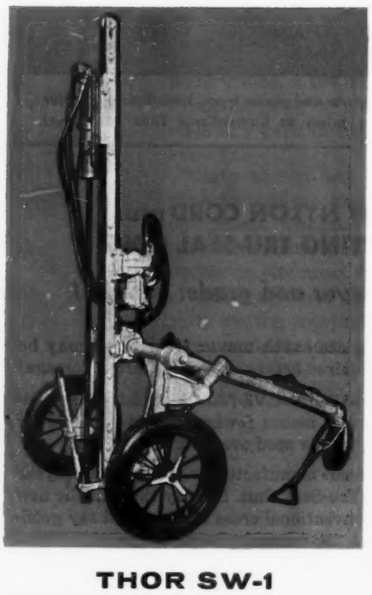
The U. S. Bureau of Public Roads, which compiles the roadbuilding data from which federal estimates of future work are made, points out "the record breaking rate of 1955 . . . was completely overshadowed in the public mind by the much greater mileage of improvements still needed to remove congestion, delays, and accidents. These improvements were not in prospect of being made without a more widespread public demand . . . (but) during the year there was increasing evidence of such a demand. One of the year's most significant developments was the widespread recognition of the urgent need to modernize the 40,000-mile network of interstate highways.

Industrial construction, another category expected to spearhead this year's rise in volume of new work, has also been the subject of some careful private appraisals. One such estimate by Walter Kidde Constructors, Inc., engineers and builders, predicts that "the rate of industrial construction in 1956 may exceed the boom year of 1955 by as much as 15 or 20 per cent . . ."

"Projects contracted for during 1955 assure our industry of a high volume of field construction during the next twelve months," says President T. C. Williams, of the National Constructors Association. This group is composed of leading engineering and building firms engaged in the

Cut down man hours! Speed up hole drilling!

2 new more powerful Thor wagon drills!

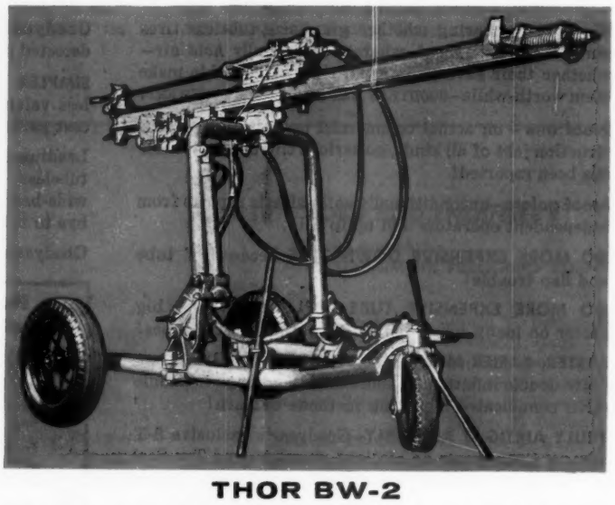


THOR SW-1

Compact size—3 wheel reinforced rig • Weight with model 75 drifter—768 lbs. • 2 handle controls movable along mast • Handles up to 3½" bore drifter • New centralizer swings out of way for close drilling • Mast swings 360° vertical or horizontal • Wet or dry operation

General purpose SW-1 • Heavy duty BW-2

Now Thor offers two new wagon drills to fit every drilling requirement — wagon drills which will outperform and out-last other models. Drill holes in any direction, at any angle, on level or sloped ground. One man operation cuts costly man hours. Check these features on the new heavy duty BW-2 and the general purpose SW-1 and then call your Thor contractors tool distributor for a free trial of the model that fits your job.



THOR BW-2

5 h.p. rotary air motor • 3 wheel reinforced heavy-duty rig • Variable speed control • Motor and controls movable along mast • Wet or dry operation • Mast swings 360° vertical and horizontal • New centralizer swings out of way for close drilling • 800 to 1000 lbs. pulling power for steel removal • Spring buffer prevents chain breakage • Equipped with Thor 105 drifter. (4" bore)

Thor PORTABLE POWER TOOLS

THOR POWER TOOL COMPANY, AURORA, ILL.

Atlanta, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, Los Angeles, Milwaukee, Newark, Long Island City, N.Y., Philadelphia, Pittsburgh, St. Louis, San Francisco, Seattle, Toronto Canada: Export Division, New York City

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design and construction of chemical plants, petroleum refineries, steel mills, power plants, and other industrial facilities. Mr. Williams notes that clients seem more confident of the future than at any time since the end of World War II. "Once having decided upon new or expanded plant facilities, they show little hesitation. Instead, the question generally is: 'How soon can we get it?'"

Fabricators of structural steel with orders depending largely on heavy construction volume, also are looking forward to an active year. Earle V. Grover, president of the American Institute of Steel Construction announced in a year-end statement: ". . . . . the statistical reports of backlogs of orders on hand and bookings of future orders received, which are compiled by the Institute, both indicate substantial increases over a year ago. . . . Bookings of new orders during 1955 were about 3,400,000 tons —the highest since 1929 and 35 per cent above the 2,510,000 tons booked in 1954. . . . During 1955 . . . the total backlog of structural steel orders on hand showed a steady rise each month. . . ."

Concerning the construction industry as a whole, H. E. Foreman, managing director of the Associated General Contractors of America, has expressed the opinion that federal estimates are on the conservative side. Preliminary estimates of the AGC indicate that non-residental construction, both private and public, may approach $28 billion in 1956, representing a gain of 9 to 10 per cent over 1955. "The private categories will be paced again by substantial increases in industrial and commercial activity, and bolstered by a continuing high level of work by privately owned utilities . . . Church construction (also) seems headed for another boom year . . . State and local public works are increasing steadily under terrific demand . . . principally (for) highways, schools, and sewer and water projects. . . ."

The AGC concludes: "When maintenance and repair operations are added to the value of new construction, total construction activity in 1956 probably will account for approximately 15 per cent of the gross national product, and construction—directly or indirectly—will provide jobs for about 17 per cent of the gainfully employed.

Manufacturers optimistic

Some of the most optimistic comment comes from equipment manufacturers who have a heavy stake in the welfare of the construction industry, second only to that of the contractors themselves. Here are some opinions leaders of this allied industry have expressed on 1956 construction prospects:

Lee Morgan, Manager of Sales Development, Caterpillar Tractor Co.: "As in 1955, our principal problem in 1956 is going to be that of manufacturing enough machines to meet the demand of our customers. . . . Aside from production, we anticipate that heavy construction in 1956 will probably exceed 1955—possibly by something like 10 per cent.

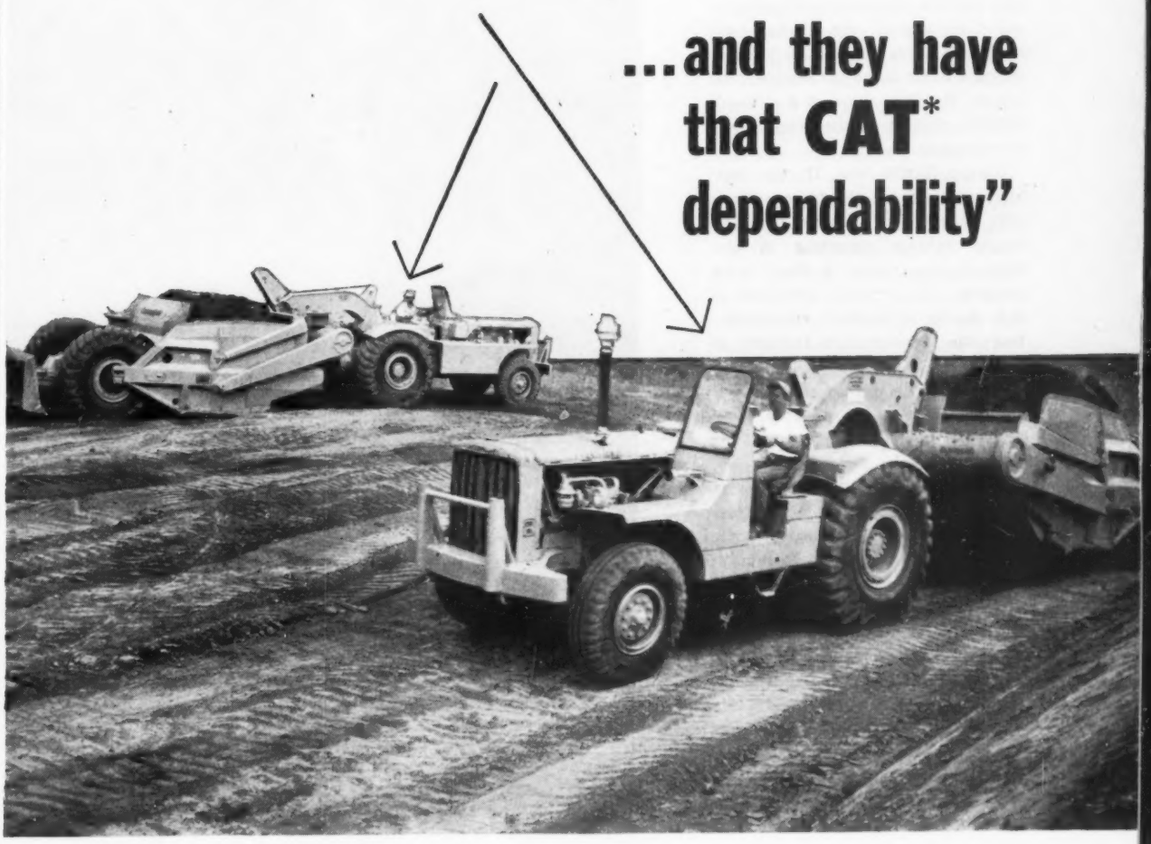
R. M. McLean, President, Jaeger Machine Co.: "I believe construction machinery sales for the calendar year 1956 will be larger than those for 1955 regardless of the fact that I do not think that over-all construction activity will be much different in volume from that of 1955 . . . my reasons are the fear on the part of the buyer—and rightfully so—that prices are not too stable and the prevailing steel shortage, (which) at least for the first six months of 1956, will be quite critical in certain spots and for certain types of material."

H. T. Reishus, vice president of International Harvester's Industrial Power division is 'generally optimistic about 1956." Harvester, which recently reported a 16 per cent increase in sales for fiscal 1955, is stepping up its 1956 sales target for its Industrial Power Division by more than 50 per cent. Reishus' sum-up: "In 1955 we got cranked up, but in 1956 we're really going to let fly."

Kenneth Lindsay, executive vice president, Iowa Manufacturing Co., and president of Construction Industry Manufacturers' Association: "With an expanded highway program in sight . . . which probably would get a start sometime during 1956, it looks to me as though there cannot help but be a larger volume of construction. . . . The manufacturers can provide the machinery if the steel and the products of steel are available in sufficient quantities . . . All signs point to at least a 5 per cent increase in new construction. . . ."

Said F. J. Whelan, vice president of Worthington Corporation: ". . . the post-war years of construction activity were not a 'boom' but . . . a return to peacetime progress. And when we think in terms of American progress our optimism is unlimited." THE END

"They move plenty of dirt ...and they have that CAT* dependability"



A county road south of Bloomington, Kansas, had to be straightened. Fill for the job—some 70,000 yards of clay and loam—were to come from changing Kill Creek's channel . . . a big assignment that called for fast-stepping heavy-duty machines. G. W. Christolear, of Heide & Christolear Construction Co., Smith Center, Kansas, says, "We looked the earthmoving equipment field over, watched all makes of rubber-tired machines, talked to the owners, and settled on Caterpillar DW15s. The fact that they move plenty of dirt and have that Cat dependability convinced us."

The DW15s on this job haul heaped loads in their No. 15 Scrapers, making an 800-yard round trip in just over four minutes. They go ten hours a day on only 35 gallons of fuel.

These 186 HP four-wheeled workhorses are designed and built for tough, fast, economical work. They offer ten forward speeds to 24 m.p.h.—to 31.3 m.p.h. with optional gears. They perform especially well in narrow, confined areas. And they work smoothly with a complete line of matched units—with scrapers, and with bottom dump and side dump wagons.

But only a real demonstration can show you the DW15's advantages. Call your Caterpillar Dealer today. And remember, he's always handy with competent service and factory parts—parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

For more facts, circle No. 204→

The newly elected first vice president of the AASHO is Rex M. Whitton, chief engineer of the Missouri State Highway Department. He will succeed the late president, F. D. Merrill.

C&E Staff Photos

AASHO urges expanded road program this year

Highway officials suggest higher taxes and credit financing; president-elect Merrill dies after close of annual meeting

Tragic overtones followed the 41st convention of the American Association of State Highway Officials when Maj. Gen. Frank D. Merrill (ret.), the newly-elected president, died suddenly of a heart attack. The 52-year-old New Hampshire State Highway Commissioner was stricken December 11 while stopping in Florida en route to his home in Concord, following the December 6–9 annual AASHO meeting at the Jung Hotel, New Orleans, La.

During World War II, the late highway head led the famous Merrill's Marauders, a tough band of jungle fighters operating in the China-Burma sector. A West Point graduate, Gen. Merrill also held a B.S. degree in military engineering from the Massachusetts Institute of Technology.

Other officials elected at the meeting include: first vice president, Rex M. Whitton, chief engineer, Missouri State Highway Department; and treasurer, E. W. Kilpatrick, state highway engineer, New Jersey State Highway Department. Regional vice presidents chosen are: Region 1, John W. Johnson, superintendent, New York State Department of Public Works; Region 2, C. R. McMillan, chief highway commissioner, South Carolina State Highway Department; Region 3, L. N. Ress, state engineer, Nebraska Department of Roads and Irrigation; Region 4, Mark U. Watrous, chief engineer, Colorado Department of Highways.

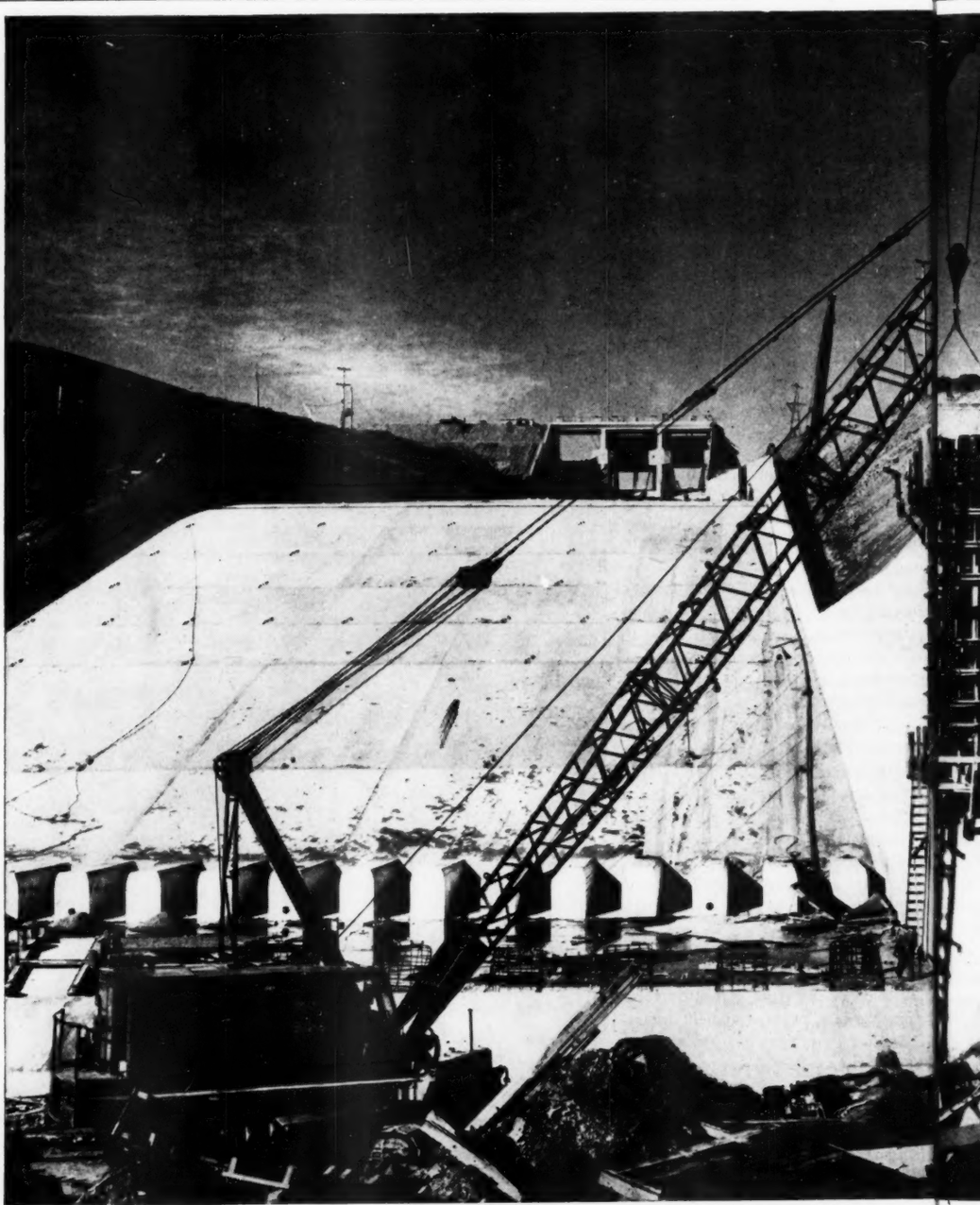
Members selected for the executive committee are: George T. McCoy, state highway engineer, California Department of Public Works; M. J. Hoffman, commissioner, Minnesota Department of Highways; Russell H. McCain, chairman, Maryland State Roads Commission; James A. Anderson, commissioner, Virginia Department of Highways; D. C. Greer, state highway engineer, Texas State Highway Department; C. D. Curtiss, commissioner, Bureau of Public Roads; John A. Volpe, commissioner, Massachusetts Department of Public Works; R. R. Bartelsmeyer, chief highway engineer, Illinois Division of Highways; George S. Covert, director, Louisiana Department of Highways; and W. A. Bugge, director, Washington Department of Highways.

Expand the road program

Raising its collective voice in protest, the American Association of State Highway Officials petitioned Congress, as it did last year, to enact an adequate and enlarged construction program for highways. The AASHO pointed out the danger if the second session of the 84th Congress delays in taking action on roads. The highway chiefs foresee additional critical traffic congestion and accidents unless an enlarged program is speedily enacted. To overcome this serious road inadequacy, the group suggested that funds be made available for apportionment to the several states by July 1956.

An AASHO policy statement on 1956 federal legislation was incorporated into a resolution adopted by the convention delegates. It recommended that in view of the federal responsibility in the National Defense system of highways, Congress should consider dedicating more of the general fund to road construction.

Such additional revenues as may be needed in the judgment of Congress for financing an enlarged highway program, according to the state-



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TEXACO

TEXACO

Soft shoulders—but not the kind found in Bourbon Street night spots—temporarily slow up a busload of AASHO convention delegates en route to inspect construction work on the Lake Pontchartrain Causeway.

After master minding the job of freeing the bus from the soggy gumbo soil, host-state delegate and guide Torbert Slack takes a bow. The Louisiana Roadside Development Engineer is also an historian of the War Between the States.

ment, could be obtained by:

1. A reasonable increase in the present federal motor-fuel tax.

2. A reasonable tax or an increase in tax on items not now taxed by the states.

3. The reasonable use of short-term credit financing with due consideration to its effect upon the national debt limitation.

Nearly 1,400 delegates and guests, including 400 wives, set an association attendance record at the four-day sessions.

In the annual address of the retiring president, 1955's chief, George T. McCoy, California state highway engineer, was hopeful that "the stumbling blocks of haste, politics, and disagreement over financing would give way before long in the face of the recognized urgent need for modern highways." He warned the delegates, however, that "In view of the partisan consideration which befell the highway program in Congress in 1955, there are grounds for a very real fear that election-year politics might add fuel to this dangerous fire."

Voices of Congress

Several Congressman who addressed the national gathering were in agreement as to the need for an adequate road program. They also predicted that the coming session of Congress would pass a bill providing an adequate plan for the proposed costruction or improvement of the 40,000-mile interstate highway system. The law makers conceded that compromises must be expected by both the Senate and the House, particularly with regard to financing.

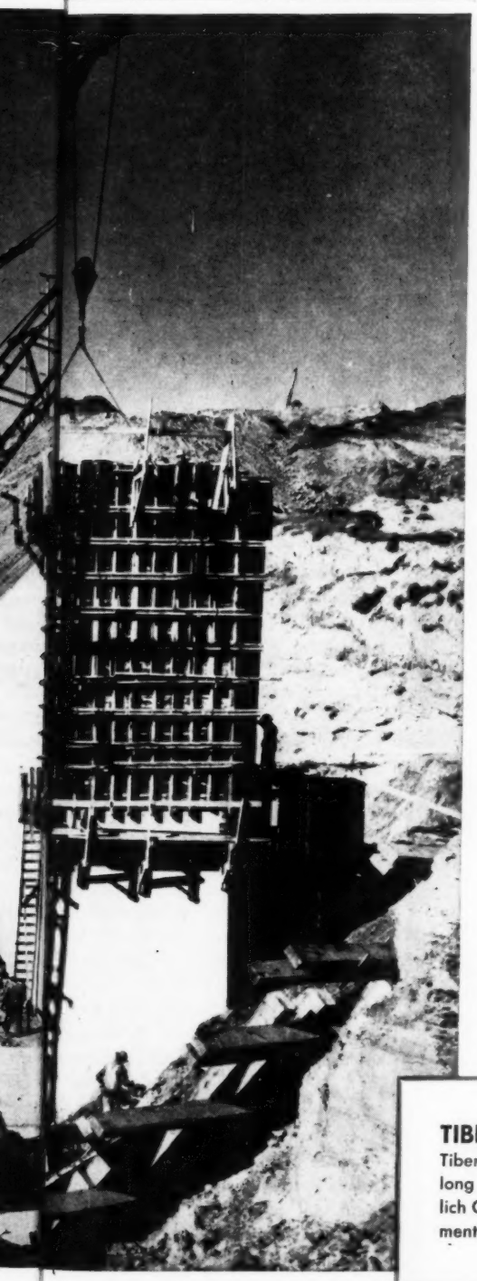
Sen. Edward Martin, (R., Pa.) stated that while he favored the pay-as-you-go principle, he would support either a bond plan to get the roads built or any reasonable compromise to assure prompt action. Sen. Martin declared that the Interstate System is a prime responsibility of the federal government, designed to meet the military, civil defense, and industrial needs of the country. It will connect 42 state capitals, and 90 per cent of all cities with populations of over 50,000. According to the senator, it will take about $25 billion to complete this system.

Sen. Albert Gore, (D., Tenn.) author of a federal-aid highway bill, also said he believes the government should operate as much as possible on a pay-as-you-go basis, and that highway construction should be financed by direct appropriations by the Congress. He conceded, however, that if highway expenditures require more money than current taxes provide, he would support measures to bring in more revenue to avoid deficit financing. The Tennessee Democrat reminded the convention that the Administration bill had been defeated in both houses, but that the Senate highway bill is alive and halfway to enactment.

"We must look ahead to the next session," Sen. Gore stated. "The Senate has already passed a bill. If the House can pass a reasonable bill next session, we will have a program."

Another Tennessee democrat, Rep. Clifford Davis, said there is no reason for the government to create a corporation which would require the payment of about $11½ billion in interest to build some $25 billion

(*Continued on next page*)



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JAMES & WUNDERLICH, contractors, handle all construction work at Tiber Dam, Montana. To keep their huge task force of equipment operating dependably and economically, they rely on Texaco for all lubrication. Reports Mr. F. A. Bleecker, Project Superintendent:

"To keep our equipment on the job constantly, we need really effective lubrication—and get it with Texaco. Our diesels, for example, deliver top-notch performance with *Texaco Ursa Oil Heavy Duty*. In addition, we've improved preventive maintenance procedures and cut costs by following the Simplified Lubrication Plan recommended to us by a Texaco Lubrication Engineer. Thanks to Texaco, we get the high equipment efficiency necessary to keep the work ahead of schedule."

Before you start your next project, ask a Texaco Lubrication Engineer about the Texaco Simplified Lubrication Plan. He'll show you how — with *no more than six Texaco Lubricants* — you can handle *all* major lubrication, save time and money, eliminate errors.

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TIBER DAM, crossing the Marias River Valley 13 miles below Tiber in Northwest Montana, will be 205 feet high and 4,300 feet long when completed. Guy H. James Construction Co. and Wunderlich Contracting Co., contractors for the project, lubricate their equipment with Texaco exclusively.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 205

Visiting highway officials take to boats to look over construction operations on the 24-mile Lake Pontchartrain bridge. The 2-pile 54-inch hollow cylindrical prestressed concrete bents support 56-foot prestressed, precast spans. Here the deck is 20 feet above water. *C&E Staff Photo*

(Continued from preceding page)

worth of roads as proposed in the Clay committee's report on the interstate road system.

"All past federal-aid bills," he added, "have contained apportionment formulas for dividing the moneys authorized among the states on the basis of population, area, and mileage. This concept will not meet the objective of completing the interstate system in a given period of time, nor will it give equitable treatment to the states from the standpoint of the estimated cost of completing the system in each state, or provide a uniform rate of progress to assure simultaneous completion of the entire 40,000 miles."

The only way fully to accomplish the objective, he added, "is to compute the estimated cost of completing the system in each state and allocate to each state the amount of federal funds necessary to permit the state to do the job. Under this approach each state will receive what it needs to pay for its portion of the system."

Rep. Myron V. George, (R., Kans.) stated that in his opinion it will be the duty of all elected and appointed officials to see that we construct immediately an adequate highway system so that this important segment of our economy may not be stagnated by lack of proper legislation and financing.

"Congress must resolve its differences as to how this program is to be financed," he continued, "and get the money to you people so that construction can get under way immediately."

Technical papers

Among the more helpful technical papers presented at the convention was the one given by M. W. Fisher, engineer of maintenance, State Highway Commission of Wisconsin. Titled "New Developments in Highway Maintenance Equipment," this paper described 18 recent developments that have improved the efficiency of highway maintenance departments. Some of the units mentioned are manufactured commercially, while others have been brought out by highway agencies.

Another paper that aroused great interest was "Increasing Engineering Productivity for New Program Levels" by A. C. Clark, Deputy Commissioner for Engineering, U. S. Bureau of Public Roads. Clark pointed out that the airplane and the new electronic devices will come to the rescue of the highway engineers in overhauling old civil engineering practices, and will speed up highway improvement under the larger road program. Radio, of course, is being used in both construction and maintenance operations. Electronics is employed in controlling the mixing of road materials, in changing roadsign messages, in weighing trucks, and in exploring the types of subsurface materials that must be excavated in the building of highways.

The BPR official called attention to the use of the airplane and high speed electronic computers, in combination, to determine the most economical highway location, to reduce the engineering time requirements and place jobs under contract sooner, and to expedite the final determinations of work performed so that contractors can be paid more promptly. Clark estimated that where the conventional method of plotting field notes, checking, inking, templating, planimetering and computing volumes requires from 90 to 100 man-hours per mile at a cost of about $200 for personal services, the electronic computer method would require only about 3 man-hours per mile at a cost of about $20 for personal services plus rental of equipment.

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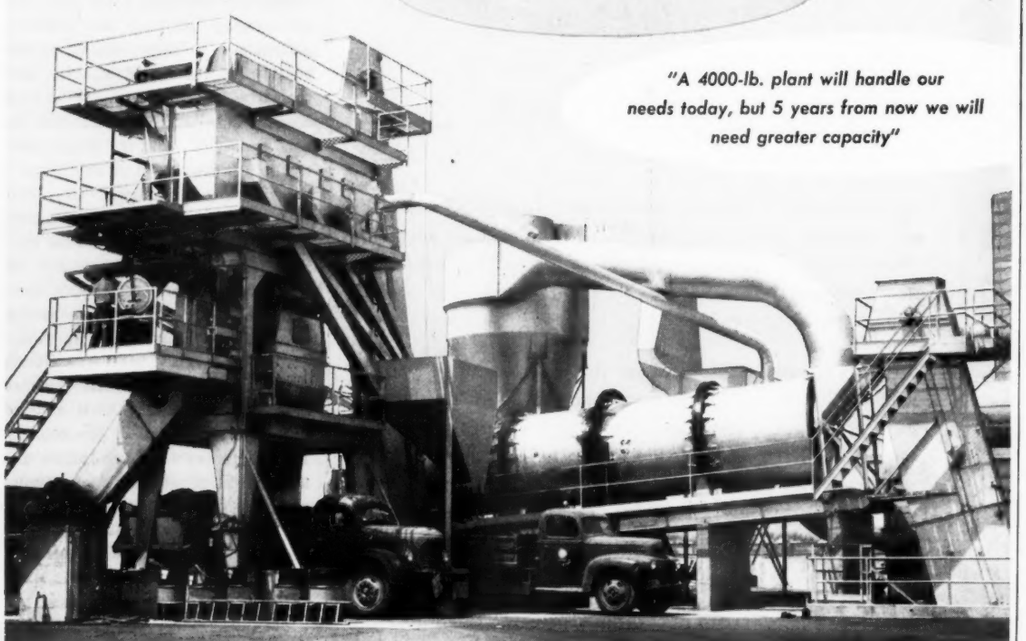

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Local projects

The convention city of New Orleans is currently absorbed in the construction of two great bridges at its "front and back doors." One will be the longest cantilever structure in this country, spanning the Mississippi River at the Crescent City. It was described in two papers given before the Committee on Bridges and Structures. Frank M. Masters, Modjeski & Masters, Consulting Engineers, discussed "Selection of Type and Location of the Greater New Orleans Bridge." This was followed by "Construction of the Foundation of the New Orleans Bridge" by Carl B. Jansen, President, Dravo Corporation.

With a main span of 1,575 feet, the new Mississippi River Bridge will be exceeded in length only by the Quebec Bridge in Canada and the Firth of Forth Bridge in Scotland, which have main cantilever spans of 1,800 and 1,700 feet, respectively. The new bridge at New Orleans is expected to be completed next year. A group of delegates visited the project as the guests of the consulting engineers and the pier contractor. The highlight of this trip was the inspection of Pier 2 caisson, which is being sunk in the river to a founding elevation of minus 180 in stiff gray clay. The main bridge will cost about $25 million.

At the "back door" of the city, the longest vehicular bridge in the world is being constructed across Lake Pontchartrain at a cost of $27,600,000 by the Louisiana Bridge Co., a joint venture of Brown & Root, Inc., Houston, Texas, and T. L. James & Co., Ruston, La. This 24-mile-long Lake Pontchartrain Causeway is already completed 7 miles out from Mandeville, La., on the north shore, and is scheduled for completion late this year. The long structure includes 2,246 spans. A typical span, 56 feet in length, is of prestressed concrete and is completely fabricated ashore and lifted into place by floating equipment. Spans are supported on two-pile bents up to 96 feet in length. The 54-inch hollow cylindrical concrete piles are also prestressed and precast.

Delegates and guests made an all-day field trip to this project on Thursday, December 8. The inspection-tour party went to the contractor's casting yard at Mandeville by bus. Cars and station wagons then transported the group over the 7 miles of completed causway and to boats available for a view of the marine operations—pile driving, capping, and placing of the deck sections.

The AASHO will meet in Atlantic City, N. J. at the Traymore Hotel for its next annual convention. THE END

Ferguson contract

A contract for the construction of a catalytic reformer and hydrogen plant for the $10 million refinery to be erected near Grand Junction, Colo., has been awarded to H. K. Ferguson Co., Cleveland, Ohio.

N. J. Parkway-N. Y. Thruway link waits on financing

Now that a report has proved the project feasible, the Garden State Parkway Authority is preparing for temporary financing arrangements for the 9-mile link between the New Jersey superhighway and the New York Thruway.

The Parkway's feeder road would run from the northern terminus at Paramus, through upper Bergen County to the New York State Line. The link would open up a new route for motorists traveling between New England and New York State and the New Jersey shore, and permit traffic to bypass metropolitan New York City. The traffic engineering firm of Coverdale & Colpitts made the study of the road, which will cost about $18 million.

Estimates show gap between needed and actual road funds

Needed work on the interstate highway system for the ten year period ending in 1964, according to state estimates compiled by the U. S. Bureau of Public Roads, will come to a total of $27 billion, $12 billion of which will be needed in rural areas.

At the present annual rate of spending—$175 million under the Federal-Aid Act of 1954—it will take more than 50 years before the 40,000-mile interstate system reaches even a tolerable level of efficiency.

Last big job is started on Delaware River project

Work on the last phase of the Delaware project—a project designed to increase the water supply of New York City—got under way last month.

The remaining job, construction of a $140 million reservoir and a tunnel to carry water from Cannonsville reservoir to a collection point at Rondout reservoir, will give an additional 310 million gallons to the city's water supply every day. The entire job is expected to be finished by 1961.

Proposed Amendment 29 in Alabama, permitting two counties to divert highway-user tax revenue, was defeated by an estimated margin of more than 3 to 1 last month.

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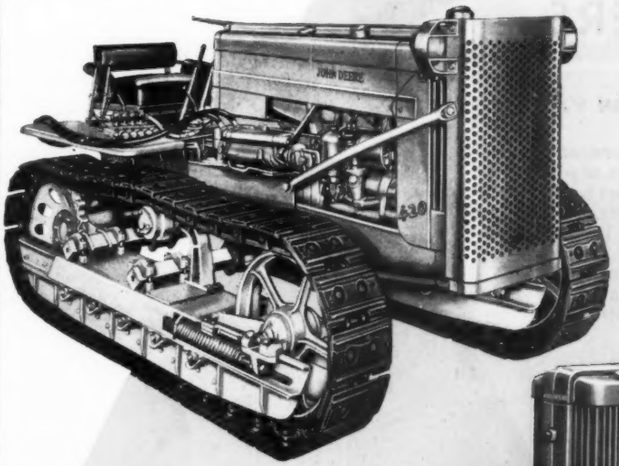

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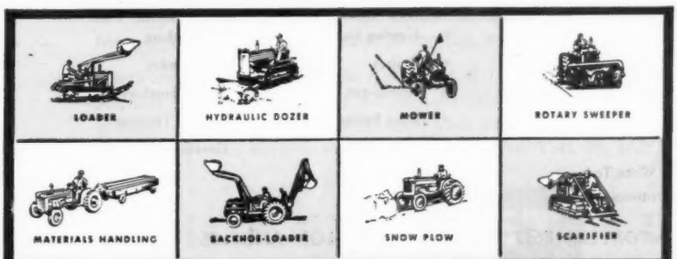

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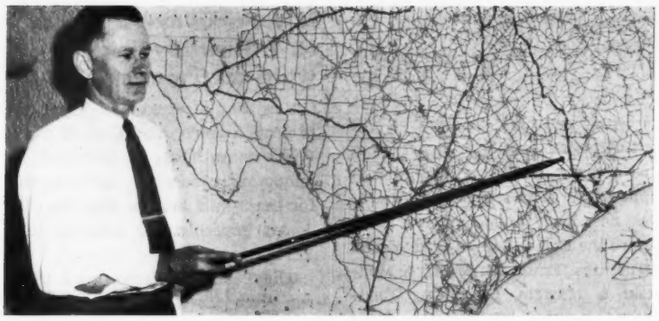
Texas highway engineer champions road development

Dewitt C. Greer sponsors 27,000-mile farm-road program; plans expressways to relieve urban traffic congestion

by RALPH MONSON



Dewitt C. Greer, Texas state highway engineer, points out a particularly congested area near Houston. Expressways are being planned and constructed to relieve traffic bottlenecks like this.

Service to his own state and to national highway groups has won wide recognition for Dewitt C. Greer, Texas state highway engineer. A term as president of the American Association of State Highway Officials in 1950, and committee work with the Highway Research Board and the American Road Builders' Association have brought him into contact with almost every other state in the Union.

This growing influence was climaxed in 1954 when, under the auspices of the International Road Federation, Greer toured England, France, Germany, Denmark, and Norway lecturing government highway officials, engineers, contractors, equipment and material men, as well as the general public. In Denmark, he spoke of Industry and Highway Relationships; in London, it was the Development of a Modern Highway System; in Oslo, his talk was titled Traffic Engineering and Its Application to American Road Development.

All were down-to-earth discussions of highway problems based on his experiences as chief administrator of the Texas highway department. Where there was a language barrier, written translations of the talk were distributed to the audience in advance. This, and the abundant use of slides to illustrate his points, made the talks successful.

Yet, recognition for his work is only incidental to the importance of the day-by-day service to his state and its highways. The adoption of the farm-road program, which now includes almost 27,000 miles of surfaced all-weather rural roads, was influenced by his sponsorship, while his active interest in the highway problems of urban areas has led to the planning and construction of a system of expressways which is doing much to relieve urban traffic problems and stabilize economic values. His dealing with these extremes, together with the more common highway problems, has won high praise for the administration of his department.

Advocates construction by contract

Practically all of the construction on Texas highways is done by contract, the policy of the department being to do little or no work by force account.

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Mr. and Mrs. Greer, in England during a lecture tour in 1954, chat with Sir Alfred Bossoms at a reception held in their honor by the Anglo-Texan Society.

During a meeting of the Royal Empire Society, Mr. Greer and Lord Sandhurst, BRF, enjoy a private joke. While in England, Greer spoke on the development of a modern highway system.

or questionable work. Greer's formula for highway contracts goes something like this:

"Low bidder gets the job; once he has the job, he works according to plans and specifications; when the work is done he gets his money so he can go out after another contract." Proof of the popularity of this straightforward policy is found in the large number of bidders on practically every job advertised by the Texas Highway Department and by the number of friends Greer has won among Texas roadbuilders.

Greer claims Texas as his native state under the accepted theory that any place near Texas should belong to it—regardless of boundaries. The East Texas Chamber of Commerce in its publication "East Texas" puts it this way: "Dewitt Greer is surely a native of East Texas. He was born in Shreveport, La., which is usually considered to be a part of East Texas."

However, his parents, who had lived in Texas previously, returned to the Lone Star State when Dewitt was only a few weeks old. Greer grew up in the town of Pittsburg, Texas, and received his early education there. Later, he attended Texas A&M College, where he specialized in highways, graduating in 1923 with the degree of Bachelor of Science in Civil Engineering.

It was then that he got his start in highway construction by working on the back of an asphalt distributor. After a season of this, Greer volunteered to supervise construction activities of a convict labor camp on state-park work.

Reflecting on these early experiences, Greer says, "Living with the convict camp for a year and riding the back of that distributor brought me down to earth. I felt imposed on at the time, but now I know that these experiences rounded me out, so that I was ready to start my engineering career."

That career really started when he took the job of city engineer for Athens, Texas, a growing community with a population of about 5,000. The city needed street paving, curb and gutter, sewers, and other construction work, and the young city engineer soon found that he had to make the surveys, draw the plans, set the stakes, and supervise the construction.

(*Continued on next page*)

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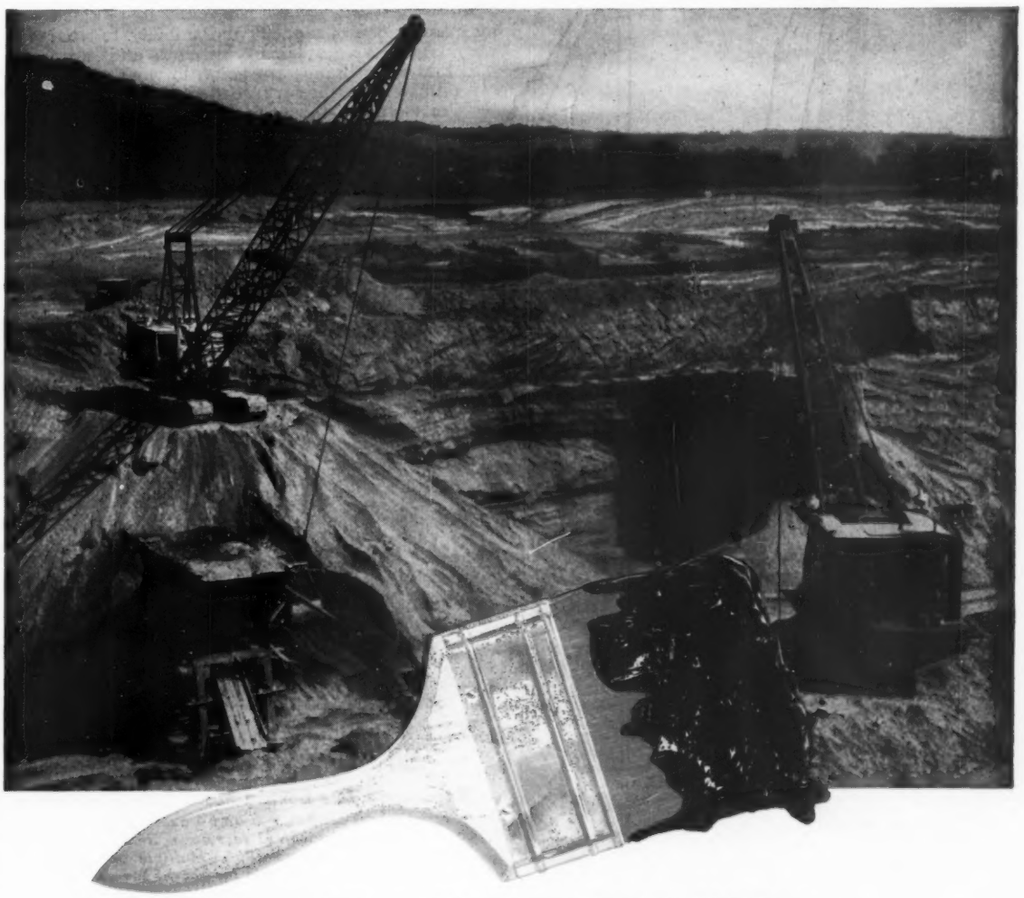

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SINCLAIR JET LUBRICANT

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About this time, the Texas highway department was undergoing reorganization and was seeking new engineers. Greer gave up city engineering in 1927 to become an assistant resident engineer in the Tyler District of the highway department. This proved to be an important step, and advancements came rapidly.

The Tyler district engineer left the department to go into contracting in 1929, and Greer became district engineer of an eight-county district. In 1936, he left the district position to become chief engineer of design and construction in the department's central office in Austin. Four years later, the Highway Commission appointed him state highway engineer, the chief administrator of the highway department. Last July he completed his 15th year in this office.

Expands farm-road program

Greer takes particular pride in the accomplishment of the Land Service Road Division which was organized under his sponsorship in 1946. Through this division, some 26,740 miles of farm-to-market roads have been brought into the state system, and every mile of this type of road is a hard-surfaced all-weather highway designed to carry at least 200 vehicles per day.

Realizing that the planning and construction of this type of road was very different from the work on the average trunk-highway system, Greer insisted that the new division be isolated from other activities of the department. He selected Ben Freeborough, now retired, to head the division and told him to gather the best possible staff. These people were instructed to think only of service to the land and were not to concern themselves with the problems of those who designed the primaries and expressways.

The farm-road system consists of many roads winding through rural areas regardless of whether the principal industry is agriculture, forestry, or mining. As a road is taken into this system, it is regraded to remove objectionably sharp curves or steep grades and to provide a minimum surfaced width of 20 feet. Stabilized base and a single or double-penetration surface treatment usually complete the construction.

Alignments which follow river valleys rather than cross them are chosen to minimize the number of major bridges required. As an example of the distribution of the cost of these projects, 1954 construction, averaging $11,351.86 per mile, was distributed as follows:

Grading	18 per cent
Small structures	11 per cent
Base	37 per cent
Surfacing	15 per cent
Bridges	17 per cent
Miscellaneous	2 per cent

Routes are selected to pick up the maximum amount of local traffic, since approximately half of the mileage is on school-bus routes and about the same percentage is on rural mail routes.

From the standpoint of economics, Greer points out that the traffic normally doubles when these dirt roads are paved. The volume doubles again when the dead ends of two or more of these roads are connected. This increased traffic means greater gasoline consumption and therefore more tax revenue for the highway department. Thus the expenditure for the improvement is justified.

Practically all of the roads in this system have been improved by contract. These jobs have appealed to many of the smaller contractors who find it difficult to get contracts for primary and expressway construction. It is not unusual to have as many as 14 or 15 bidders on a farm-road project costing $50,000 or less.

Plan expressway system

While Greer and his department have been promoting the rural-road program, they have not neglected the problems of heavy traffic in urban areas. At the time Greer took office, state highways were built only to the limits of cities but in two years this condition was rectified and state highways were carried through cities.

With the tremendous increase of traffic in and around such major cities as Houston, Dallas, San Antonio, and Fort Worth, the construction of expressways has become a practical necessity. Here again, specialists have been assigned to the planning and construction of these superhighways. Freed of other duties, these men can think in terms of expressways without having to also consider the problems of primary and secondary road systems.

At the present time, the department is spending about $18 million per year on expressway construction in and near the large cities. Even with this large expenditure, the program lags far behind actual needs. However, the work is being done on a pay-as-you-go basis without deficit financing.

Greer insists that expressway designers plan to serve the land. Practically all of the expressways have land-service roads on both sides with access to express properly limited and controlled. Experience has shown that these service roads increase the

LOADED

with PROFIT MAKING Features

More and more jobs today call for big crane capacity —plus *fast mobility*. Lorain's ability to produce this combination of capacity and mobility, to meet any conditions, explains why more and more Lorain Moto-Cranes are going to work. These rubber-tire cranes are "loaded" with the kind of features that mean better performance, lower costs and higher profits. In the Lorain Moto-Crane line, you select from the capacities below in combination with a wide variety of tire, axle and drive arrangements to meet all traction and travel conditions. Best of all, you get the Lorain designed and built Moto-Crane carrier, designed specifically for this type of work and loadings . . . and available in some models as an "8 x 4". Don't settle for less, when a Moto-Crane gives you so much for your money!

ONLY LORAIN OFFERS THIS SELECTION

Here are a few Lorain Moto-Crane features:

• Front wheel drives • 3 and 4 axle carriers* • Dual controls for self-propelled service • Removable counterweights for road travel* • Multiple position turntable mountings, adjustable for shovel-hoe-drag ranges or top crane capacity* • Precision boom lowering device • Pin-connected tubular chord booms for maximum capacity at minimum weight* • 2-piece, extensible tip extensions* • High gantries* • Ability to back-down-the-load • Third drum • Precision power load lowering . . . and there are many more.*

See your Thew-Lorain Distributor for all the facts.

THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.

*Not on all models . . not all equipment listed is standard.

MODEL	CAPACITY	MODEL	CAPACITY
DIXIE	6-TON	MC-424W*	22½-TON
MC-110	10-TON	MC-425	25-TON
MC-254	15-TON	MC-425W*	25-TON
MC-254W*	17½-TON	MC-524	30-TON
MC-424	22½-TON	MC-824	45-TON

*Extra-wide carriers for maximum lifting capacities "on rubber," without outriggers.

THEW LORAIN. MOTO CRANE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 210

value of adjacent land. Industrial, commercial, and residential developments have closely followed expressway construction in an unmistakable pattern.

Keeping his department geographically and functionally decentralized is another of Greer's precepts. Each of the 25 district engineers scattered throughout the state is given a great deal of independence in planning and carrying out the work in his district. In Greer's words, "Brains are not concentrated in any one man or any one place. We try to take advantage of the abilities of all of our men."

In each district, the district engineers who represent the department are carefully selected, given a degree of permanence in their positions, and provided with good offices and good staffs. They become a part of the community in which they are located, and are thus better able to understand and serve the area.

Perhaps the greatest tribute to Dewitt Greer came from the men of his own profession when, at the 1953 AASHO convention, he received the George S. Bartlett Award—one of the highest honors which can be conferred on a highway builder.

THE END

New York Trap Rock buys West Nyack firm

The New York Trap Rock Corp., New York, N. Y., has purchased the land, plants, and equipment of the West Nyack Trap Rock Co., West Nyack, N. Y., a property comprising 150 acres of land and containing an estimated 25 million yards of crushed trap rock. The West Nyack plant has an annual stone-producing capacity of 500,000 tons.

Trap Rock's four quarries—at Haverstraw, Tomkins Cove, Clinton Point, and Verplanck, last year produced a total of seven million tons of stone products. The new plant will enable Trap Rock to serve the northern part of Bergen County, N. J., and the southern and western parts of Rockland County, N. Y., where a great deal of highway and road construction is planned. The 40 employees of West Nyack Trap Rock, forming a nucleus of what is expected to be an expanded work force, bring over-all employment in the New York Trap Rock Corp. to about 800.

Issue report on study of roadside development

The final report of the Landscape Bureau of the New York State Department of Public Works details the findings of a study of roadside development.

Entitled "Roadside Vegetative Cover", the booklet discusses climate, soils, design, plants, and shoulders.

A list of equipment useful in roadside-development work is included.

Photographs, maps, tables and charts, and formulas make the text easy to follow.

A preliminary report of this work was issued in 1953. The 1951–1954 report is available through the State Department of Public Works, Albany, N. Y.

For more facts, circle No. 211→

Name chief civil engineer on Iran development job

Robert Millard Pope this month left for Tehran, Iran, where he will act as chief civil engineer on a seven-year social-development plan under contract to Litchfield-Whiting-Panero-Severud & Associates, New York, N. Y., through the Iranian government.

Pope will assist Reginald C. Smith, director of engineering, and will act as a direct representative for Guy B. Panero in matters pertaining to the project's water and sanitation facilities.

A graduate of the University of New Hampshire with a B. S. in civil engineering, Pope holds a Master's degree from Harvard. He has worked on water supply projects, waste and water treatment plants, and sewage and industrial waste projects for both municipalities and industries.

Signode promotion

Joseph F. Beckman has been made assistant director of sales and manager of industry sales for Signode Steel Strapping Co., Chicago, Ill.

Beckman joined Signode in 1925, and in 1943 was made district sales manager of the Los Angeles area. In 1950, he was promoted to district sales manager of the New Orleans region.

Plans gain momentum for 1957 ARBA Road Show

Modern road-building machinery, including equipment that is newly designed or older units that have been improved, will be unveiled at the ARBA Road Show in the Chicago Amphitheater from January 28 through February 2, 1957. The first Road Show since 1948, this one will feature a "show within a show"—an exhibit of highway materials and supplies. Every major manufacturer will be represented in the 300,000-square-foot display area which tens of thousands are expected to visit during the week-long show.

D9 MOVES BIG YARDAGE for MORRISON-KNUDSEN

A CAT* D9 Tractor with No. 9S Bulldozer is the prime earthmoving tool on this Morrison-Knudsen contract in Idaho. The job—relocating 11.37 miles of the Idaho City-Owl Creek road—involves clearing 64 acres and moving 337,000 cubic yards of dirt and rock. One rock cut is 87 feet deep and there are fills up to 30 feet.

With its huge 14-foot 'dozer, capable of handling up to 9 cu. yd. at a blade load, the D9 makes 40 passes, 200 feet long, per hour.

Now that the D9 has proved itself on jobs all over the country, owners recognize it as the top production machine among big tractors. It's the first track-type tractor with Turbocharger. The 286 HP Caterpillar Diesel Engine gives it ample power to match its weight and traction. You have a choice of torque converter or oil clutch drive. And there is "Live-shaft" drive for rear-mounted equipment.

Operators say this big machine is "as easy to handle as a small tractor." Easy to service, too. The exclusive, trouble-free oil clutch, separately removable power train components and a fuel system that needs no adjustments in the field are among the reasons why.

Your Caterpillar Dealer can give you some eye-opening facts about the economy of the D9 for big yardage jobs. Ask him for a working demonstration today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Here's fingertip versatility in a big front-end attachment

On the International TD-14A, the Drott Four-in-One has a bottom-dump clearance of 11 feet.

■ "Versatile" is a word often overworked in speaking of construction equipment, but it is the right—and only—term to use in describing the Drott Four-in-One. This multiple-utility unit, first introduced to the industry late in 1954, is really four front-end tractor attachments in one.

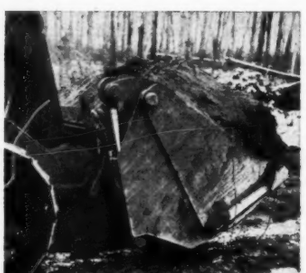
The big news about the Four-in-One this year is that is has grown up. Originally offered in ⅞ and 1¼-yard sizes (for the International TD-6 and TD-9, respectively), it now sports a 2¼-yard bucket in a new model designed for use with a big crawler—the TD-14A.

The fact is that Drott's brain child is now a strapping, man-sized unit—a big attachment that company officials feel will take a big bite out of the medium and heavy-duty earthmoving and material-handling equipment market.

While its new size (hence greater application and range) is the feature this year, the Four-in-One is still primarily noteworthy for the features which distinguished it from the beginning. These are: (1) its adaptability to four different earthmoving operations, (2) special pry-out action, (3) shoe transportation of bucket loads at ground level, and (4) exclusive hydraulic shock-absorbing system.

Finger-tip control

For the record, the Four-in-One is a skid-shovel, a bullclam, a clamshell, and a bulldozer—all rolled into one.



Close-up of Four-in-One bucket shows skid shoes (bottom rear of bucket, just ahead of crawler track) which permit heavy loads to be semi-skidded along at ground level.

A single movement of the bucket-control level converts the attachment from one to the other tool, giving an operator versatility at his finger tips and eliminating the time and labor that are involved in changing attachments.

Aside from its multiple use, the Four-in-One is probably most outstanding for the use it makes of special skid shoes located underneath the bucket. Applying the elementary principle of the lever, these shoes transmit digging force to the ground rather than back to the tractor. This pry-over-shoe break-out action not only gives greater digging force, but eliminates the terrific strain on a tractor that digging and rock-removing often produce.

Carrying strain on the tractor is also considerably reduced by means of the skid shoes. Instead of being carried up in the air, the loaded bucket is carried at ground level and

THE ESSICK MODEL VR-54-T EASILY COMPACTING TO SPECIFICATION 21 INCH LIFTS OF GRANULAR FILL IN A CONFINED AREA ON A CALIFORNIA FREEWAY.

CONTRACTORS REPORT 45% TO 75% SAVINGS IN COSTS OF COMPACTING OF SUB-BASE, BASE AND SURFACE FINISHING

THE VR-28-W ESSICK VIBRATING ROLLER SHOWN COMPACTING BACK FILL OVER A CONCRETE DRAIN PIPE ON A SECTION OF THE SAN BERNARDINO FREEWAY IN CALIFORNIA. THIS COST CUTTING MULTI-PURPOSE MACHINE WILL COMPACT 25 CU. YDS. PER HOUR OF GRANULAR FILL MATERIAL TO THE MOST EXACTING SPECIFICATIONS. ROLLING ON EITHER HOT OR COLD ASPHALTIC MATERIALS OR PATCH PAVING THE 800 LB. VR-28-W IS EQUAL TO A 5 TON ROLLER.

CONTACT YOUR ESSICK DISTRIBUTOR OR THE ESSICK MANUFACTURING COMPANY FOR DETAILED LITERATURE

THE ESSICK MODEL VR-32-R VIBRATING ROLLER WORKING ON A HIGHWAY RESURFACING PROJECT IN PHOENIX, ARIZONA. THE COMPACTION OF THIS VERSATILE ONE TON ROLLER ON PAVING OPERATIONS IS EQUAL TO THAT OF A TEN TON ROLLER. IT IS OUTSTANDING IN COMPACTING ROCKS AND GRANULAR BASE MATERIAL.

CONTACT YOUR ESSICK DISTRIBUTOR OR THE ESSICK MANUFACTURING COMPANY FOR AN "ON THE JOB" DEMONSTRATION

ESSICK MANUFACTURING COMPANY

1950 SANTA FE AVENUE
LOS ANGELES, CALIF.

850 WOODRUFF LANE
ELIZABETH, NEW JERSEY

MANUFACTURERS OF CONSTRUCTION EQUIPMENT SINCE 1922

Affiliated with **THE T. L. SMITH COMPANY,** Milwaukee, Wisc.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 212

With clam open and blade on ground, the Four-in-One offers an efficient bulldozing blade for road grading.

semi-skidded along on the shoes. The advantages of this feature are immediately obvious: greater loads are possible, there is less strain on the hydraulic system, and the operator's vision is not obstructed. Bucket rollback is also greater with the skid-shoe feature.

By incorporating its exclusive shock-absorber, the Hydro-Spring, into that part of the hydraulic system that supplies oil to the lifting side of the main lift cylinders, Drott has come up with still another important feature. This system absorbs and cushions the terrific hydraulic shocks normally encountered in front-end loaders. An estimated two-thirds reduction in these shocks is the result, which means added life for the hydraulic system, the loader, the tractor—and the operator. The unit's closed hydraulic system also keeps air and dirt out, oil in.

Four operations

As a skid-shovel, the Four-in-One will do straight-ahead filling with the bucket tilted forward to cut the depth desired. Once filled, the bucket may be tilted back, semi-skidded along on the shoes, and dumped from overhead either by forward tilting or by opening the clam and bottom-dumping.

As a bulldozer, the attachment is used with the clam wide open and the blade and shoes on the ground. A greater or lesser degree of cut may be obtained by pitching forward or rolling back the blade. As a bullclam, the unit is operated partly open so that the clam determines the depth of cut. Material rolls up into the bucket in a scraper-like operation.

Clamshell operation is also simple. The bucket is opened wide and tilted forward so that a bite may be taken. The clam is then closed on the material, and the bucket tilted back for transporting—again on the skid shoes. Over-head bottom-dump discharge is a simple operation which also provides greater dumping height than normal forward-dumping.

As a bulldozer, the Four-in-One provides a moldboard 94 inches long and 38 inches high. As a skid-shovel, clamshell, or bullclam, it offers a 2¼-cubic-yard bucket 24 inches deep. Clearance under the bucket when bottom dumping is 132 inches; when forward dumping, 101 inches.

The variety of jobs this versatile attachment can do is almost unlimited. Some of them include land-clearing, stripping, bulldozing, grading, spreading, stockpiling, backfilling, loading, and rock or log removal.

For additional information about the new Four-in-One for the TD-14A write to the Drott Mfg. Co., 3841 W. Wisconsin Ave., Milwaukee, Wis., or use the Request Card that is bound in at page 18 of this issue. Circle No. 459.

N. Y. Thruway news

The 15,764-foot New York Thruway bridge across the Tappan Zee at Tarrytown, N. Y., was opened December 15; also a 28-mile stretch of the toll road from Suffern to Yonkers.

Plan new crossing of San Francisco Bay

Plans for a "southern" crossing of San Francisco Bay, connecting San Francisco and Bay Farm Island and costing an estimated $327,525,000 was submitted last month to the State Toll Bridge Authority. If the State Legislature approves, it is possible that the facility will be opened by 1961.

The crossing would consist of 7½ miles of tube and trestle, and bay approach systems would bring the total length of the crossing to 17 miles.

If it is constructed, the new crossing would be more expensive than either the Golden Gate or Oakland Bay bridges. These cost $35,000,000 and $77,200,000, respectively.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 213

TO CHECK DESTRUCTIVE EFFECTS of uneven expansion and contraction, ice-dissolving salt, rotting-leaf acids, and other debris —to say nothing of heavy traffic—municipal engineers in New York City have installed 16-gage, corrosion-resisting Monel dams under open expansion joints on highway overpasses. On F. D. Roosevelt Drive running along New York's East River, 0.062-inch Monel sheet was fastened under the expansion joints to keep water from eating away the steel reinforcing rods, drainage gutters, and water stops. The installation protects and prolongs the life of these members and keeps water from infiltrating the roadbed. For further information write to Architectural Sales, The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y., or use the Request Card at page 18. Circle No. 460.

Surface gravel is leveled by big Land plant

Claiming another first in highway construction, the Idaho Department of Highways used a 60-foot Landplane on an experimental basis to level surface gravel during work on a 9.6-mile section of U. S. 26 between Beeches Corner and Ririe. And the plane turned out so satisfactory a job that it even was deemed an improvement over work done with standard methods.

The idea of using a Landplane came up when the contractor and the state tried to solve the problem of avoiding the irregular profile that resulted, even with the heaviest and newest patrols, when greater tonnages of surface gravel were required on wider highways.

The road was blue topped from the subgrade up, including the subgrade, the last course of 2-inch base, and the last course of ¾-inch surface gravel. This latter course was laid in eight sections of the project, two of which were not planed.

The 60-foot Landplane used on the job was made by the Marvin Landplane Co., Woodland, Calif., and had a blade 10 feet long. Pulling the plane provided another problem.

A Hough loader operated satisfactorily over a well-laid section, but did not work well when the load was increased. A Caterpillar D7 proved more than adequate, but was too slow. Finally, a Cat No. 12 motor grader patrol was tried, and this machine proved to be the answer.

Gravel was watered, processed thoroughly, and laid in the ordinary manner. Then the course was checked so that irregularities present could be corrected.

The first pass was made with the edge of the plane near the crown. Successive passes were made down alternate sides of the road, the rig working out to the shoulder until the roadbed had been planed. Then the motor grader brought the plane down the shoulders, blading off any segregated material that had accumulated just off the edge of the road.

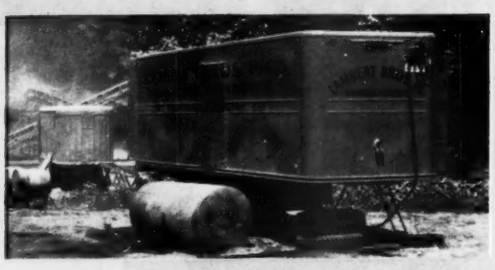
The important step during this operation was to give the gravel a liberal shot of water before it was planed, then roll the material immediately after the plane had passed.

The only other problem was encountered when too heavy a cut was taken, or when the moldboard ran dry. However, it was found that if the blade were set to cut about ¼ inch, it picked up enough gravel and held it throughout the run, cutting high places and filling low ones without overloading the blade or running short of material.

The two important points about this job were that the material had to be damp enough to blend easily and that the 60-foot Landplane was suited to the grades and alignment on this job. Sharp vertical and horizontal curves would have been warped out of shape by a plane of this length.

←For more facts, circle No. 214

HOW MOBILE CAT* POWER PAYS OFF FOR LAMBERT BROS., INC.



A D397 Mobile Electric Set provides crusher power on a job for Lambert Bros., Inc., near Greenback, Tennessee. The 315 KW D397, Caterpillar's biggest trailer-mounted electric set, is well within highway weight and size restrictions.

When Lambert Bros., Inc., Knoxville, Tennessee, received the contract to furnish 26,000 tons of base material for road construction near Greenback, it set up the operation pictured here. The company provided its own power with this Cat D397 Mobile Electric Set. The 315 KW unit provided the power to run the Cedarapids crusher, working 8 hours a day, 5 days a week. Output averaged about 900 tons a day. Said Lambert's Ben L. Greene: "I like the D397 because it gives us a maximum amount of operation with a minimum amount of maintenance."

For dependable electric power, *when* it's needed and *where* it's needed, you can't beat Caterpillar Electric Sets. They're available in a complete range of sizes, up to 315 KW, for use in emergency or full-time operation. Each is a complete unit, mounted on skids, semi-trailer or trailer. Easy to hook up and easy to operate, they deliver steady voltage. There's one that fits your needs and—as Mr. Greene points out—provides maximum performance with minimum maintenance.

Wherever you move these sets, you always have the plus of prompt service, right on the spot, from your nearby Caterpillar Dealer. For complete information about these versatile power plants, see him soon.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN, HEAVY-DUTY PORTABLE ELECTRIC POWER

VERSATILE FRONT-END LOADER: Drott Four-in-One now fits the International TD-14A, boasts 2¼-yard bucket. Works as skid-shovel, bullclam, clamshell, bulldozer. Skid shoes permit greater pry-out action, full-bucket-travel at ground level; Hydro-Spring cushions shocks. **Drott Mfg. Co.**, 3841 W. Wisconsin Ave., Milwaukee 2, Wis. Circle No. 166. (See page 16 for more facts on this item.)

GIANT CRAWLER: Caterpillar's D9, a 230-hp tractor with turbocharged engine, stands 8 feet 9 inches high, is 17 feet 10¾ inches long, and 9 feet 11¼ inches wide. Weighs 56,000 pounds. Maximum drawbar pull: 60,860 pounds. Ninety-inch gage, seven-roller track. Travel speeds to 7.8 mph with torque converter. **Caterpillar Tractor Co.**, Peoria, Ill. Circle No. 126.

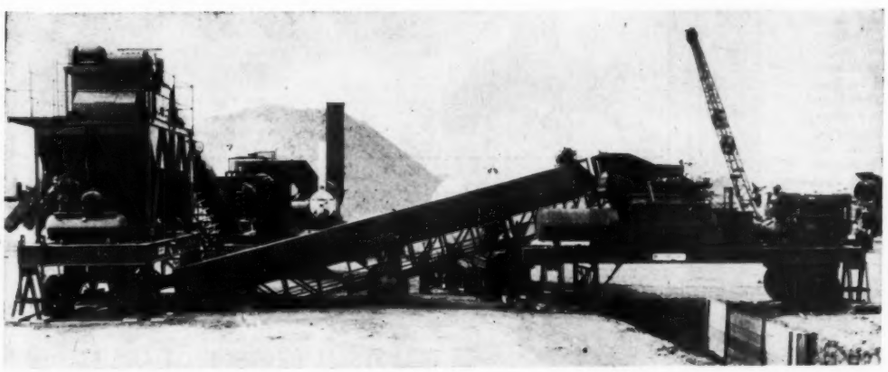
POWERFUL MOTOR GRADER: Model 5D-190 is designed to handle heaviest grading jobs. GM 6-71 diesel engine produces 195 horsepower. Power-sliding moldboard 13 feet wide shifts to 90 degrees on either side in less than a minute. Speeds: 0.85 to 20 mph. Weighs 32,000 pounds. **Huber-Warco Co.**, 202 N. Greenwood St., Marion, Ohio. Circle No. 127.

The year 1956 promises to be another record one for you, the contractor. This means more and bigger contracts; it also means that modern machinery and materials will be needed for efficient and profitable operation. To help you prepare for the new construction season, CONTRACTORS AND ENGINEERS devotes the following pages to a parade of the equipment available at the start of the year.

PRODUCT PARADE FOR 1956

To obtain detailed information about any product illustrated in this section, note the number at the end of the caption beneath the picture. Circle the corresponding number on the Request Card bound in at this page, fill out the card, and drop it in the mail. CONTRACTORS AND ENGINEERS will forward your request to the manufacturer.

NEW SCRAPER: Euclid's Model S-18, a new overhung-engine-type scraper, has struck capacity of 18 cubic yards. Powered by 300-hp engine. Allison Torqmatic drive. Full 90-degree steer permits 180-degree turns in 35 feet or less. Hydraulic control bowl lift, apron, ejector. **Euclid Division**, General Motors Corp., 1361 Chardon Road, Cleveland 17, Ohio. Circle No. 128.



PORTABLE ASPHALT PLANT: New H & B Mobile 40 batch-type unit has capacity of 100-120 tons per hour. Easily erected, completely portable. Remotely driven units electric powered. **Hetherington & Berner, Inc.**, 731 Kentucky Ave., Indianapolis 7, Ind. Circle No. 129.

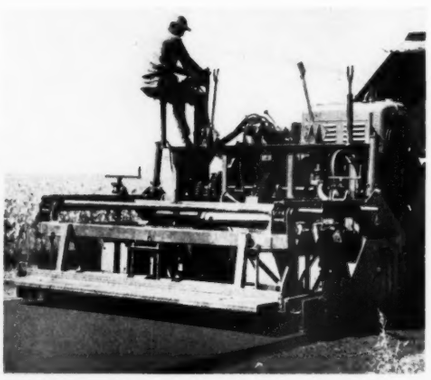
BLAST-HOLE DRILL: Joy's TWM-5 mounts a 5¼-inch hammer drill, drills 4½-inch diameter holes. Drills from 90 degrees vertical to 10 degrees above horizontal. Rubber-tire or crawler mounted. **Joy Mfg. Co.**, Oliver Bldg., Pittsburgh 22, Pa. Circle No. 130.

PNEUMATIC-TIRE ROLLER: Bros Sp-54, said to be first all-rear-wheel-drive roller with every pair of wheels oscillating, travels up to 18 mph in forward or reverse. Standard three-speed transmission with shuttle or reversing gear feature saves time by eliminating shifting through the transmission when changing direction. Continental engine (50 horsepower); double braking. **Wm. Bros Boiler & Mfg. Co.**, 1057 Tenth Ave. S. E., Minneapolis 14, Minn. Circle No. 3.

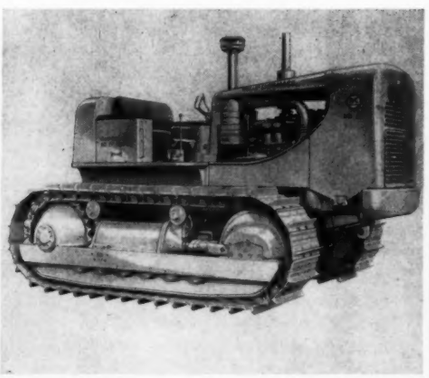
SMALL CRAWLER: Terratrac 600, rated at 57 belt horsepower, incorporates Terramatic instant-shift transmission and Borg-Warner torque converter. Continental Red Seal engine, either diesel or gasoline. Offers unusual maneuverability either as tractor-loader (bucket capacity: one cubic yard) or dozer. Other attachments include angling dozer blade, Pippin hydraulic backhoe, and 10,000-pound winch. **American Tractor Corp.**, Churubusco, Ind. Circle No. 2.

READY-MIX PLANT: Rated at 500 cubic yards per day, this Tampo Standard portable plant has 18-yard capacity in two overhead storage compartments, full 3-yard batcher, 40-foot 18 or 24-inch belt conveyor. Can be loaded with either a front-end loader or clamshell. Charges a transit mixer in 3 minutes. Complete plant can be moved on a truck float. Either gasoline or electric power available. **Tampo Mfg. Co.**, Box 2340, San Antonio, Texas. Circle No. 4.

TRACTOR-SHOVEL: Newest addition to the Payloader line, the model HO features a power-shift transmission through which all shifts can be made without stopping or even slowing down the machine. Two-cubic-yard bucket has pry-out action, 40 degrees of breakout at ground level. Loads carried low and close to the machine. Increased stability, safety, and visibility. Particular attention to driver comfort. **Frank G. Hough Co.**, Libertyville, Ill. Circle No. 13.



BITUMINOUS PAVER: Pioneer's Vibromatic marks company's venture into bituminous-paving equipment field. Key units are oscillating screed and high-speed vibrating compactor. Forward speeds up to 2.64 mph. Lays between 250 and 300 tons per hour at top speed. Paving widths: 10 to 14 feet. Hopper capacity: 4½ cubic yards. Easy service and replacement of parts. **Pioneer Engineering Works, Inc.**, 1515 Central Ave., Minneapolis 13, Minn. Circle No. 5.



CRAWLER TRACTOR: Biggest and most powerful of A-C line, the HD-21 weighs 44,000 pounds, develops 204 horsepower at the flywheel, offers torque converter drive as standard equipment. High-capacity cooling system, master clutch, Tru-Dimension tracks are features, as well as higher sustained working pressures in the power plant and wider speed ranges. New, heavier tracks of optimum hardness. **Allis-Chalmers Mfg. Co.**, Milwaukee 1, Wis. Circle No. 12.

How a Seismic Survey located bedrock for the Massachusetts Turnpike

The Massachusetts Turnpike, a 123-mile 239-million superhighway scheduled for completion in November 1956, faced a tight time schedule. The Massachusetts Turnpike Authority, through Howard, Needles, Tammen & Bergendoff, the General Consulting Engineers, called upon Gahagan to help locate bedrock. Gahagan seismic crews began work on Aug. 9, 1954 and finished on May 4, 1955. A total of 45,000 seismic instrument readings were taken. Combined with check borings at key spots, the seismic results enabled Section Engineers to construct over 1,400 cross-section profiles at 50-foot intervals. For highways, dams, power plants, bridges, etc., seismic surveys save time and money; provide a wealth of data on the subsurface. For further details write E. K. Sandbach, Vice Pres., Geophysical Survey Division, Gahagan Corp., 90 Broad St., New York 4, N. Y.

Gahagan has been a leader in the hydraulic dredging field for over fifty years

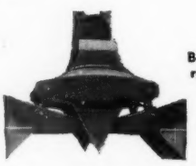
ANOTHER
GAHAGAN
CASE HISTORY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 215

BROWNHOIST bridge and crane BUCKETS

we have the type and size to best handle the job, dependent on material and equipment

Open-type grab buckets and link-type buckets for bridge cranes, fast-plant unloaders and large gantry cranes are available in capacities from 35 to 400 cubic feet.



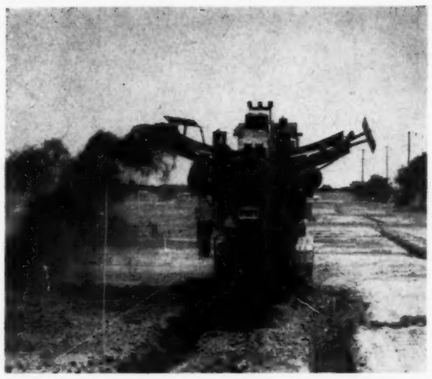
Because of their simplicity of design and rugged construction, Brownhoist buckets (such as the link-type left or the open type grab bucket above) withstand extremely severe abuse. Abrasion-resistant alloy steel nose plates protect against coarse materials.

Brownhoist clamshell buckets (right) in capacities from ½ cu. yd. to 3 cu. yds. are used with cranes for handling coal, ore, sludge, slag, rock or wet clay. They're engineered (as a result of over 80 years experience) to take full bites, year after year with trouble-free operation. Write today for catalog.

185-A

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN

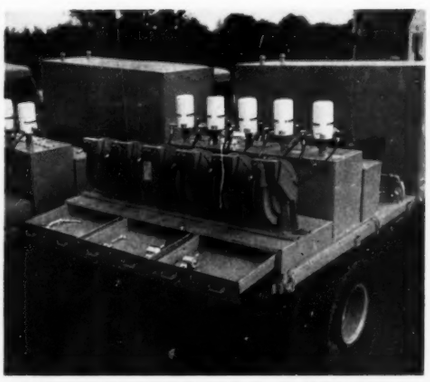
For more facts, use Reader-Reply Card opposite page 18 and circle No. 216



TRENCHER: Cleveland's improved Model 320 boasts greater engine power, increased trench-width capacity (52 inches), heavier high-tensile steel in rim and buckets. Conveyor may be added for right-side or standard left-side discharge. Extension kit adds 2 feet to spoil discharge point. Crawler kick-out clutch permits stopping and starting without interruption of digging or other operations. **Cleveland Trencher Co.**, 20100 St. Clair Ave., Cleveland, Ohio. Circle No. 7.

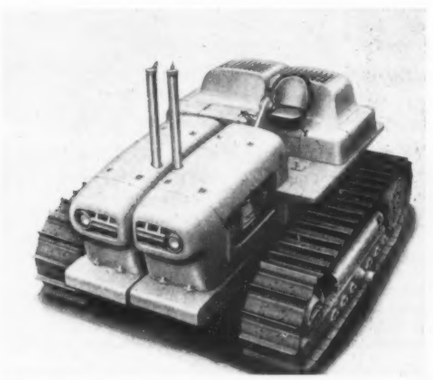
TRACTOR-SHOVEL: Michigan Model 175A now features new turbocharged diesel engine rated at 165 horsepower. Torque converter, power-shift transmission, planetary-wheel drive axles, four-wheel drive, rear-wheel steering are also features. Four forward and four reverse speeds (maximum speed: 27 mph). Bucket capacity is 2¼ cubic yards. **Clark Equipment Co.**, Construction Equipment Division, P. O. Box 358, Benton Harbor, Mich. Circle No. 6.

HIGHWAY-MAINTENANCE TRUCK: FWD's Model M-264 sports, besides the four-wheel-drive feature, a 6-yard dump body, Wausau hopper-type spreader, underbody blade for spreading sand, salt, calcium chloride, or other loose material. Gasoline engine rated at 165 horsepower; diesel engine also available. Truck rated at 26,000 gvw. For ice control, snow plowing, and hauling in adverse travel conditions. **Four Wheel Drive Auto Co.**, Clintonville, Wis. Circle No. 11.



LUBRICATING UNIT: This Cemco mobile lubricating shop, mounted on an Oshkosh 22,000-gvw truck chassis, includes a 200-gallon gasoline tank, 400-gallon fuel-oil tank, five air pumps which dispense gear grease, track lube, high-pressure grease, and two grades of motor oil. Pump and 30-foot hose dispense gasoline and diesel fuel oil. Unit also includes 25-cfm air compressor and tool box. **Cemco Industries, Inc.**, Galion, Ohio. Circle No. 9.

RUBBER-TIRE ROLLER: Both BMCO's 9-wheel and 13-wheel models offer front-wheel drive, new segmented design for exceptional maneuverability. Maximum weights: 18,000 and 26,000 pounds, respectively; rolling widths: 66 inches and 95 inches, respectively. Hydraulic steering and brakes, fully oscillating rear wheels, simplicity of design for easy maintenance. Speeds to 13.6 mph. **Browning Mfg. Co.**, 111 Humble Ave., San Antonio 6, Texas. Circle No. 8.



TWIN-ENGINE TRACTOR: Euclid's huge (more than 69,000 pounds drawbar pull) new TC-12 represents a new size class for crawlers. Track gage is 110 inches; over-all width, 136 inches; over-all length, 194 inches. Two GM 194-hp diesels supply power. Separate Allison Torqmatic drives for the two tracks. Boasts exceptional work capacity for push-loading, bulldozing, and other big operations. **Euclid Division**, General Motors Corp., Cleveland 17, Ohio. Circle No. 10.

PLAY IT SAFE

with MILLER Tilt-Top!

Miller's big broad oak decked platform assures the safety of operator and equipment every time you load! Saves time, too . . . there's no need to bother with special skids, cribbing or jacks. ONE man simply drives on or off the tilted platform. Total time, less than two minutes! Whatever you haul . . . dozers, trenchers, rollers or other heavy equipment, there's a MILLER TILT-TOP to do your between-job hauling faster, safer and at less cost! See your MILLER distributor today!

Heavy D-4 dozer being loaded on Model "B" 10 ton TILT-TOP built upon the new, massive "EDG-SUPPORT" frame, now standard on all MILLER TILT-TOPS.

✓ built best

✓ priced best

See your MILLER distributor or write for FREE literature to:

Miller Tilt-Top Trailer Co.

457 S. 92nd Street, Milwaukee 14, Wis.

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SAVE TIME, MONEY, LABOR WITH THESE STURDY PUMPS

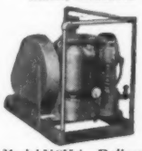
★Just turn the high pressure hose on that heavy equipment for a quick clean-up. The solid, hard, driving, high pressure stream from a Hardie Powered Pump Unit will strip off the caked mud, grease, dirt—even that "behind the ears"—in a matter of seconds.

★The Hardie Spray Gun is readily adjustable by a pressure of the fingers from solid stream to a high pressure spray for over-all washing, or a fog like mist for fragile things and fog fire fighting.

★Hardie builds powered pump units in many sizes and models. Enclosed units from 5 gpm at 300 psi to 24 gpm at 400 psi. On casters or skid mounted units up to 60 gpm at 800 psi. Handle all liquids, chemicals, semi-liquid materials. All Hardie pumps are trouble-free, rugged, vertical piston-type pumps that work to their ratings smoothly, quietly, at slow speed.

Enclosed unit. All working parts are readily accessible.

Model LC—Delivers 50 gpm at 800 psi.



Model XCVA—Delivers 18 gpm at 600 psi.

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The Hardie Manufacturing Co., Hudson, Mich.
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Please send Pump Catalog.

Name_____

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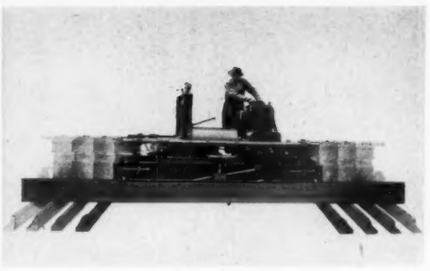
HEAVY-DUTY TRENCHER: The Earthripper is available in three sizes to dig from 4 to 10 feet deep and from 10 to 30 inches wide in hardest formations. Continuous bucket line for greater efficiency; truck mounting for increased economy. **Owen-Pewthers Mfg. Co.**, College Station, Texas. Circle No. 14.

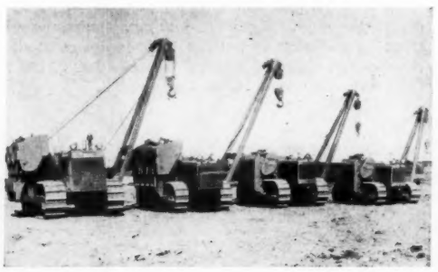


FINISHING MACHINE: New Flex-Plane unit widens by fingertip control to permit work on wide or variable-width slabs. Entire frame widens easily to accommodate variations. Gives greater uniformity to roadway, reduces hand labor. **Flexible Road Joint Machinery Co.**, Warren, Ohio. Circle No. 21.

POWER SHOVEL: The Type 24 Jobmaster, equipped with 17½-foot boom, 6-foot arm, Esco ½-yard bucket. Hercules JXD gasoline engine. Also operates as dragline, clamshell, dipper, crane. Treads of various widths. **Baldwin-Lima-Hamilton Corp.**, Construction Equipment Division, Lima, Ohio. Circle No. 22.

SELF-PROPELLED SCRAPER: LeTourneau-Westinghouse Co.'s B Tournapull, a 23-yard single-engine unit. Either GM or Cummins diesel (293-hp) engine. Speeds to 28.4 mph. Electric controls, easy maneuverability, simple maintenance. **LeTourneau-Westinghouse Co.**, Peoria, Ill. Circle No. 25.

ALUMINUM FASTENING STUDS: Rivweld studs secure corrugated aluminum sheeting speedily, without interior scaffolding. Nelson portable stud-welding gun fastens the aluminum studs. **Nelson Stud Welding Division**, Gregory Industries, Inc., 2715 Toledo Ave., Lorain, Ohio. Circle No. 19.

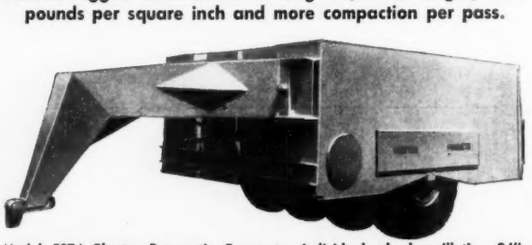


LINE OF SIDEBOOMS: Designed for use on International crawlers from TD-24 (left) to TD-9 (right), new Superior sidebooms boast lift capacities ranging to 110,000 pounds. Hydraulic extendable counterweights; new horizontal operating levers. **Superior Equipment Co.**, Box 30, Bucyrus, Ohio. Circle No. 16.

RUGGED!

Chester Pneumatic Compactors and Tamping Rollers

Feature rugged construction for long life, extra weight, more pounds per square inch and more compaction per pass.



Model 50T4 Chester Pneumatic Compactor individual wheel oscillation 24", universal draw bar, extra strong body.

Model 1760 Chester Tamping Roller with sheep feet. Round or wedge feet optional. Complete line includes other sizes.

Partial list of Chester Dealers:

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D. D. Kennedy.....Bellwood, Ill.
Giles & Ransome.....Philadelphia, Pa.
Highway Equipment..... Cincinnati and Dayton, Ohio
Virginia Tractor.....Richmond, Va.
L. B. Smith, Inc.....Harrisburg, Pa.
McAllister Mach. .....Indianapolis, Ind.
R. L. Harris, Inc.....Knoxville, Tenn.
Perkins & Milton..... Springfield and Boston, Mass.
Michigan Tractor.....Detroit, Mich.
Ohio Machinery.....Cleveland, Youngstown, Columbus and Toledo, O.
Whayne Supply Co.....Louisville, Paducah, Ashland, Bowling Green, Ky. and Evansville, Ind.
L. B. Smith, Inc..... Syracuse and Massena, N. Y.
Frantz Equipment Co...New York, N. Y.
Eastcoast Equipment Co..... Mountainside, N. J.

Limited number of dealerships still available in select territories. Write Roger W. Ach, Sales Manager, for details.

CHESTER PRODUCTS CO.
Division of Ransohoff, Inc.
NORTH FIFTH AND FORD BLVD. HAMILTON, OHIO

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Birmingham
HEAVY DUTY TRAILERS

Below: Model 1650-DLU (Fig. 164). Special Birmingham Trailer with extra low deck.

"RUGGED WEAR OVER THE LONG HAUL"

Birmingham Trailers are built rugged for the big loads. There are standard designs and models for all kinds of hauling. Special models are built to order to your own specifications. Standard models 10 to 100 tons capacity. Special models 40 to 265 tons capacity.

Write or wire for catalog and name of our Distributor in your territory.

PARTS SERVICE

We carry a complete line of standard parts for all models of Birmingham Trailers. Our parts service is prompt and reliable.

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New York Office, 30 Church St., N. Y. 7, Phone Digby 9-2893 • Cable Code Address: "BIRMCO"

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ASPHALT SUPPLY TRAILER: Built for rugged treatment on fast-moving jobs. Glass fiber insulation for units hauling hot material. High or low-pressure burner equipment; choice of pump and engine combinations. Stock or custom sizes. **Standard Steel Works, Inc.**, 16th and Howell Sts., North Kansas City, Mo. Circle No. 15.

RUBBER-TIRE SCRAPER: International's Model 75 Payscraper, rated at 18.5 cubic yards heaped. Haul speeds to 24 mph. Power train operates from 262-hp diesel; 31½ per cent more power than previous models. Five forward, one reverse speed. **International Harvester Co.**, 180 N. Michigan Ave., Chicago, Ill. Circle No. 17.

VIBRATING ROLLER: Model VR 54 T trailer-type roller, weighing 3,225 pounds, consolidates earth fills in excess of 95 per cent of AASHO tests. Also vibrates fine materials for water-bound base for macadam. Works in cramped quarters. **Essick Mfg. Co.**, 1950 Santa Fe Ave., Los Angeles 21, Calif. Circle No. 18.

SHOVEL-CRANE ATTACHMENT: New loading attachment adapts Link-Belt Speeder LS-98 for horizontal straight-line loading operations. Excaloader is fingertip, hydraulic-power controlled. Requires only 15 feet 10 inches clearance. **Link-Belt Speeder Corp.**, Cedar Rapids, Iowa. Circle No. 23.

JOINT-CUTTING MACHINE: Vibro-Joint cutter is self-propelled, one-man operated, hydraulically controlled. Vibrating cutter bar separates aggregate over the joint, pulls sand and cement mortar back into crevice on withdrawal. **Vibro-Joint Co., Inc.**, 1104 Main St., Dallas 2, Texas. Circle No. 20.

HEAVY-DUTY TRUCKS: New Mack B-80 line includes 11 models of from 46,000 to 65,000 gvw. Gasoline or diesel engines rated at 170 to 300 hp. Four and six-wheel units for heavy off-highway work. Optional power steering, other features. **Mack Trucks, Inc.**, 350 Fifth Ave., New York, N. Y. Circle No. 24.

TAMPO SP-9

Self-Propelled Pneumatic Tired Roller

The Tampo self-propelled machine is offered with either gas or diesel power. Optional equipment includes water sprinkling system, coco mats, lights and water ballast if desired. It is a nine wheel machine employing 7.50 x 15 4 or 6 ply tires affording a solid rolling width of 72".

Shown here is a Tampo Model SP-9 self-propelled pneumatic-tired roller owned by MacDougald Warren, Inc., of Atlanta, Ga. This roller is being used to compact the new asphalt runway aprons at the famous City of Atlanta Airport. The modern airplanes of today with their heavy wheel loads demand the utmost in compaction, hence, the use of the self-propelled Tampo machine. With its oscillating action combined with the kneading characteristics of the tires the Tampo SP-9 assures that all air and gas formations below the surface of the asphalt are "squeezed" out. At the same time the wheel spacing prevents the sealing of the asphalt while compaction is being accomplished.

For the name of your nearest dealer or for further information Call or Write:

TAMPO MANUFACTURING CO.
P. O. BOX 2340 • PHONE PE 3-9171
1146 W. Laurel St., San Antonio, Texas

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How One CONTRACTOR MADE MONEY

with a WILLARD "Task Force"

. . . on 3 jobs and moved 371 miles and placed 10,000 C. Y. in '53

COMPLETELY FREE from central-mix plants and plant erection costs, this contractor handled three specification concrete jobs and moved his Willard equipment a total distance of 371 miles. They were extra profitable because he used the completely mobile Willard self-loading Weigh-Batcher, Conveyor and two Truck Mixers. He batched and mixed up to 30 cu. yds. per hour on the job using stock piled aggregates and bulk cement. There were no erection costs beyond digging a shallow pit for the foot of the conveyor . . . no loss of time by placing crews waiting for deliveries . . . and no shipping costs because the equipment moved on its own wheels under its own power.

If you are missing those *profitable* out-of-town jobs it will pay you to get the facts; write for the "Willard Way" booklet.

WILLARD
Weigh-Batch Loader

WILLARD
Mixer Loading Conveyor

WILLARD Truck Mixer

Manufactured in Los Angeles, California and Galion, Ohio

WILLARD CONCRETE MACHINERY SALES CO.
11700 WRIGHT ROAD, LYNWOOD (LOS ANGELES COUNTY), CALIF.

BATCH *and* MIX *on the job!*

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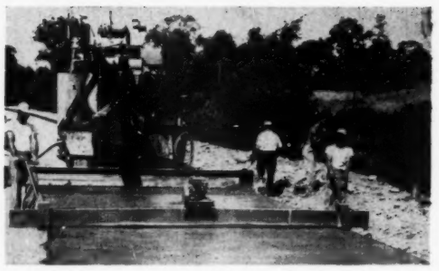
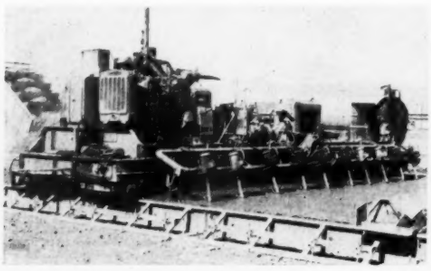
LAND-CLEARING MACHINE: R. G. LeTourneau's Tree Crasher weighs 120,000 pounds, can uproot heavy trees and clear underbrush. Ten-foot-tall tires give rig good flotation in swampy or sandy areas. Twin diesel engines. **R. G. LeTourneau, Inc.**, 2399 S. MacArthur, Longview, Texas. Circle No. 32.

TRACTOR-SHOVEL: Extra-heavy-duty power train, torque converter, four-wheel drive planetary axles give new Speedall line heavy capacity. Line includes 1¼, 1¾, and 2½-yard (above) models. Either gasoline or diesel engine. **Pettibone Mulliken Corp.**, 4700 W. Division St., Chicago, Ill. Circle No. 35.

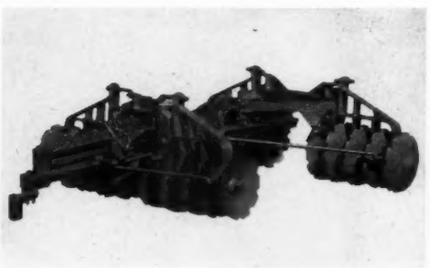


VIBRATING SCREED: Vibrating head delivering 5,100 vibrations per minute powered by 2-hp engine. Mercury Automatic clutch permits no-load starting, applies power smoothly. Standard screed beams to 30 feet; longer ones on special order. **Stow Mfg. Co.**, 40 Shear St., Binghamton, N. Y. Circle No. 31.



PAVING VIBRATOR: For vibrating low-slump concrete to full depth, or for vibrating close to side forms. Three-inch Viber vibrating heads (adjustable for paving width or depth) produce maximum compaction. Attaches to spreader. **Gar-Bro Mfg. Co.**, 2415 E. Washington Blvd., Los Angeles 21, Calif. Circle No. 470.

TRACKMOBILE: Heavy-duty machine operates on road or standard-gage tracks. Converts for either use in 90 seconds. Powerful V-8 engine provides as much as 12,800 drawbar pull for pulling loaded railroad cars or other mobile equipment. **Whiting Corp.**, 157th and Lathrop Ave., Harvey, Ill. Circle No. 34.



TANDEM HARROW: The Brushmaster dual tandem-harrow has 20 26-inch cutout blades in front, providing 10½-foot cutting width; ten 26-inch blades in rear for a cutting width of 8½ feet. Recommended for disking and brush-clearing work. **Alexander Mfg. Co.**, Picayune, Miss. Circle No. 33.

RECIPROCATING PLATE FEEDERS BUILT INTO KOLMAN PORTABLE LOADING TRAPS

50' x 36" KOLMAN Portable Conveyor-Screen Plant owned by Peter Kiewit Sons Co., equipped with built-in feeder and wing walls.

KOLMAN
COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR • SCREEN • TRAP • FEEDER

Now you can handle rough, rocky, abrasive material without fear of belt damage—you can be sure of a constant, regulated flow of material—you can enjoy all of the advantages of a feeder on a completely portable plant.

With the "built-in" feeder, both loading trap and plate feeder are designed as an integral part of the portable conveyor. The trap provides a complete cover for all working parts and is large enough to permit a man to enter on either side to service and adjust the feeder and conveyor tail section. The feeder is controlled by adjusting the length of stroke and the angle of operation.

This new Portable Feeder-Trap Combination is now available on all Model 101 Heavy Duty KOLMAN Portable Conveyors. Loss of time in setting up, taking down, and moving a separate feeder and hopper is eliminated entirely. Your portable plant is ready for operation as soon as it reaches a new job.

Steel Wing Walls Also Portable

The Portable Trap can also be equipped with steel Wing Walls extending forward and up beyond the regular loading trap wall. This additional enclosure prevents loose gravel, earth or other material from working into the conveyor tail section and eliminates the need for building awkward walls of timbers and planks. The wing walls are permanently mounted and portable with the rest of the plant.

The Feeder-Trap Combination makes it possible to use the KOLMAN Portable Conveyor-Screen Plant with virtually any type of feeding device including bulldozer, shovel, dragline or front-end loader. Available with either single, double or triple-deck vibrating screen, it is a versatile plant for high production screening too!

SEND for FREE literature

KOLMAN Manufacturing Co.
4922 West 12 Sioux Falls, S. D.
Please send free literature on—
☐ Model 202 Junior Conveyor
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☐ Screens ☐ Feeders ☐ Traps
Quote ..... size or ..... capacity.
Name .....
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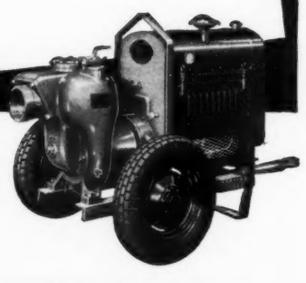
Ever read a guarantee to beat this?

The Gorman-Rupp Guarantee

Our distributors are authorized to put a Gorman-Rupp Contractors' Pump on any pumping job, any time, anywhere, alongside any other make pump, size for size. The Gorman-Rupp Pump is guaranteed to pump more dirty water more hours, using less gasoline and to prime quicker than any other self-priming pump. If it isn't the best all-around pump, our distributor will accept the return of the Gorman-Rupp Pump and pay the user any installation expense incurred.

The Gorman-Rupp Company
Mansfield, Ohio



Sizes: 1½", 2", 3", 4", 6", 8", 10". Every pump covered by this plain-language guarantee!

Gorman-Rupp PUMPS

THE GORMAN-RUPP COMPANY
305 Bowman St., Mansfield, Ohio

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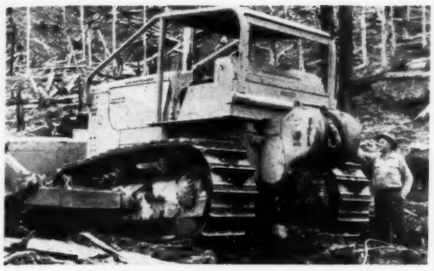
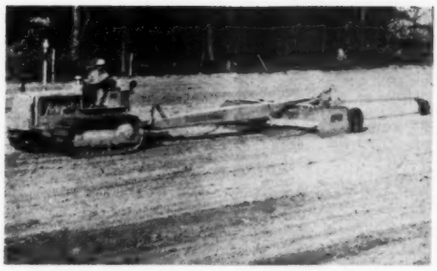


TOWING WINCH: Called world's most powerful, the Hyster D9A winch is built for use with the Cat D9, develops a line pull of 76,000 pounds. Cable capacity: 269 feet of 1⅛-inch line; 217 feet of 1¼-inch line. Automatic brake optional. **The Hyster Co.**, 2902 N. E. Clackamas St., Portland 8, Ore. Circle No. 26.



PLANE: Gurries GP-50 has 10 or 12-foot bowl, features automatic hydraulic leveling method which holds machine on straight line. Levels to 50 feet, folds to 30 feet 8 inches for transport. Planes 3.6 to 4.3 acres per hour. **Raymond Gurries Mfg. Co.**, 1720 S. First Ave., San Jose, Calif. Circle No. 36.

REAR-DUMP WAGON: The RD15 Movall, for use with Caterpillar DW15 tractors. Carries 44,000 pounds. Heaped capacity: 16 cubic yards. Positive cable-controlled ejection, spreading, or dumping. Dumping time: 11 seconds. Dumps at any travel speed. **C & D Mfg. Co.**, Folsom Blvd., Perkins, Calif. Circle No. 28.

MOTOR GRADER: Probably the biggest ever built, the T-700 is powered by a Cummins 190-hp diesel engine. Features Grade-O-Matic drive, GM-Allison torque converter, power-shift transmission. Hydraulically operated moldboard 14 feet long, 30 inches high. **Galion Iron Works & Mfg. Co.**, Galion, Ohio. Circle No. 29.

SLIP-FORM PAVER: Self-propelled machine has built-in slip forms adjustable for slabs 20 to 25 feet wide. Two 22-foot crawler tracks walk on each side of subgrade; tamping mechanism, vibrating screeds produce slabs which need no further forming. **Quad City Equipment Co.**, 646 25th Ave., Rock Island, Ill. Circle No. 30.

BACKHOE: Wagner W30 mounts most popular light tractors (here the Fordson Major), digs to a depth of 12 feet, operates through a 165-degree swing arc. Maximum digging reach: 16 feet. Hydraulically operated adjustable stabilizers. **Wagner Iron Works**, 1905 S. First St., Milwaukee 1, Wis. Circle No. 27.

NOW

A SAFER FASTER MORE RUGGED SNATCH BLOCK

the NEW

LEBUS "*TRUCKER'S*" SNATCH BLOCK

Undoubtedly the Finest Snatch Block ever designed, constructed and presented to the industry. This new LeBus Block has been *engineered for all types of heavy trucking, construction and rigging work. Special emphasis* has been placed on *STRENGTH, SAFETY* and *EASE OF OPERATION.* Only TOP QUALITY carbon and alloy steels are used in the construction and all parts are drop forged, heat-treated and processed to withstand the most rugged service. Like previous LeBus blocks, the new "Trucker's" Snatch Block requires no tools other than your hands, and can be taken completely apart within a matter of seconds.

For more information write direct or have your supply source write for catalog page 1500 for complete information on the four sizes of LeBus Blocks.

LEBUS

LEBUS ROTARY TOOL WORKS, inc.

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MEN OF STEEL

The story behind the brilliant construction achievements of the great TERRY organization is basically the story of men. Men of proven ability. Men of vast experience. Above all, *dedicated men* who have made it their business to master every facet of engineering, designing, fabricating and erecting. In every sense of the word, *men of steel.*

◀ *The entire structural steel work for the rebuilding of the Brooklyn Bridge was executed by* TERRY.

work . . . not words . . . tells the story of

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MOTOR WAGON: Hydraulically operated bottom-dump unit with 22-cubic-yard heaped capacity. Measures 12½ feet long; 8 feet 5 inches wide at top; 11½ feet long; 5 feet 8 inches wide at bottom; 6¼ feet deep. A-C 280-hp diesel engine; four forward, one reverse speeds. Faster acceleration, easy shifting. **Allis-Chalmers Mfg. Co.**, Construction Machinery Division, Milwaukee, Wis. Circle No. 60.

ASPHALT DISTRIBUTOR: Cartwright Precision distributor with Straight Line 12-foot full-circulating spray-bar featuring balanced pressure. Side-mounted engine is in a cool, accessible place. This mounting permits tank to be close to cab, thus eliminating excessive overhung weight at the rear. **Cartwright Industries**, P. O. Box 3251, South Highland Station, Birmingham, Ala. Circle No. 61.

TIP-BACK BUCKET: Designed for use with Tractomotive TL-12 Tracto-Loader, this new bucket has as much as 25 degrees tip-back at ground level. Four-wheel-drive loader thus has greater versatility; one-cubic-yard bucket loads faster, easier, and in a variety of unusual conditions. Carrying height of 3 feet, with tip-back of 41 degrees. **Tractomotive Corp.**, Deerfield, Ill. Circle No. 62.

To the man who's thinking about buying a new truck:

maybe you're missing something...

➢ And what you're missing is more than "maybe," it's for *sure*—if you haven't yet visited your Dodge truck dealer.

➢ Do you want to miss a *rock-bottom price?* Perhaps you haven't realized that Dodge trucks actually cost *less* than you'd pay for corresponding models of most other makes.

➢ Do you want to miss *power* so high it leads the field? Consider this: with engines of 169 to 175 horsepower, Dodge overpowers *every other leading make of truck* in the low- and medium-tonnage fields.

➢ Surely you don't want to miss the many advantages of "*Job-Rated.*" Because all units from engine to rear axle are engineered and matched for a specific job, the Dodge truck you buy is exactly *right* for your business.

➢ You don't want to miss Dodge safety—which includes the biggest wrap-around windshield of any truck on the road, the shortest turning radius. Or Dodge superior cab comfort . . . Forward Look Styling.

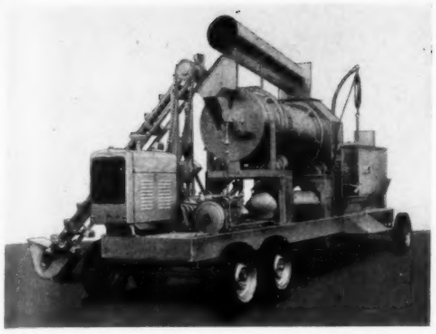
➢ In short, you get a whale of a lot more truck for a good deal less money than you think! Stop in and see your Dodge truck dealer right away—don't miss *anything!*

DODGE Job-Rated **TRUCKS**
WITH THE *FORWARD* LOOK ➢

For more facts, use Reader-Reply Card opposite page 18 and circle No. 227

DITCH TAMPER: GT-5-D Triplex unit has newly designed handlebars which adjust vertically, horizontally. Allows operator freedom to work in trenches as narrow as 10 inches and as deep as 5 feet. Recommended especially for these narrow areas. One man, working from surface level, reportedly does work of five with this tool. Compacts backfill to required density. **Gunderson-Taylor Machinery Co.**, 1237 Shoshone St., Denver, Colo. Circle No. 69.

OIL FILTER: Luber-Finer Model 363-C for engines with up to 4-gallon crankcase capacity. Simplified screw-in-type pack eliminates possibility of oil bypassing pack. Single-bolt closure. Positive-sealing O-ring-type gasket assures leak-proof lid closure at all operating pressures. One-piece extruded steel housing, rugged mounting bracket design are features. **Luber-Finer, Inc.**, 2514 S. Grand Ave., Los Angeles 7, Calif. Circle No. 67.



MOBILE BATCH PLANT: Model L-8 features larger oil burner on aggregate dryer and improved dryer drum. Produces 10 to 15 tons per hour. Batch discharge from pug mixer: 850 pounds. Reciprocating plate feeder with divided hopper and two discharge gates. One-man operation. Choice of 50-hp gasoline engine, diesel unit, or 30-hp electric motor. **White Mfg. Co.**, Elkhart, Ind. Circle No. 64.

COMPACTION ROLLER: Model K-45 Kompactor has four large-diameter rolls with welded steel segments arranged in staggered rows around each roll. These segments enter loose material with minimum lateral or longitudinal displacement, leaving the compacted area undisturbed. Weighs 32,000 pounds. **Buffalo-Springfield Roller Co.**, 1210 Kenton St., Springfield, Ohio. Circle No. 65.

WELDING UNIT: Self-contained Weldmobile with engine directly coupled to generator. Acetylene, oxygen tanks carried at rear; welding, travel, power controls on special dashboard in front of driver. Choice of 400 or 600-amp models. Up to 110 volts dc auxiliary electric power. Ready for use almost instantly; has 2,000-pound drawbar pull. **Hobart Bros.**, Troy, Ohio. Circle No. 63.

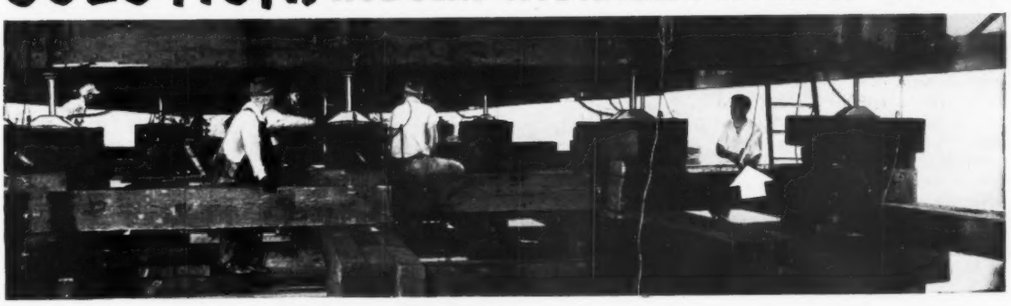
EXPLOSIVES TAMPING POLE: Sectional tamping pole features 10-foot sections joined together to form pole adaptable for any depth hole. May be used in horizontal or vertical applications. Douglas fir sections are 1½ inches in diameter; all joints are of non-sparking magnesium-bronze. Uses any size wooden tamping plug. Successfully used to 120-foot depths. **Ideal Explosives Supply Co.**, 95 Craggy Ave., Ashville, N. C. Circle No. 66.

SALAMANDER: Hy-Lo Junior designed for use where headroom is limited. Shorter stack (over-all height: 53¾ inches) and larger diffusion hood than previous models. Patented return gas stack directs products of combustion back to the flame for re-burning, eliminating waste. Produces 70,000 to 140,000 Btu, burning 10 to 20 hours on one-half to one gallon of fuel oil. **Scheu Products Co.**, P. O. Box 262, Upland, Calif. Circle No. 68.

PROBLEM: RAISE A BRIDGE 20 FEET . . .

When this photograph was taken the jacks were suspended (in their supporting blocks) from the bridge deck while the cribbing was raised to the next jacking level.

SOLUTION: RODGERS HYDRAULIC JACKING UNITS!



It isn't often that you have to raise a bridge, but when you do, you'll discover why versatile, powerful Rodgers Hydraulic Jacking Cylinders and Pumps were selected by the Engineering Department, City of Minneapolis, as the safest, quickest and lowest cost method for raising two bridges spanning the Mississippi River. Both structures were raised twenty feet as part of the development of the upper river harbor.

One bridge, consisting of four 200 foot spans and the other, consisting of six 156 foot spans, were raised by lifting one span at a time. To do the job, twenty 50 ton jacking cylinders were placed on cribbing—10 at each end of the span to be raised. An electrically powered hydraulic pump operated the group of ten cylinders at each end. A 13 inch ram travel on the jacks produced completed lifts of an average of 5 feet per 8 hour day, including all cribbing and staying assemblies.

Remote, push button controls permitted the pump operator to go under the bridge where he could watch each lift first hand. The individual pumping source at each end assured absolutely equal lifting force at every jacking point.

Rodgers Hydraulic Jacking Units with hand or powered pumps can be used wherever needed to PUSH, LIFT or PULL. Available in capacities from 50 to 600 tons with standard ram travels from 6 to 48 inches. Ram travels to 72 inches available on special order. Rodgers engineering department will be glad to assist you in the selection of the exact jacking units required for your particular lifting, pulling or pushing job—large or small.

FREE—Complete report on the jacking phase of the bridge raising job described above—written for you by the engineer-in-charge! Ask for Bulletin 327. You'll also want Rodgers free Bulletin 317A. It contains a complete description of Rodgers Hydraulic jacking units, quick couplers, valves and hoses, and a description of hydraulic equipment used in the construction of tunnel shields.

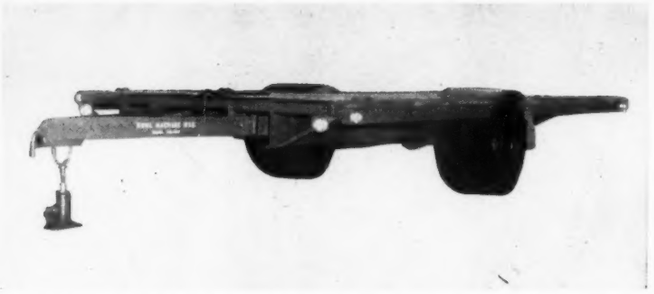
HYDRAULICS by Rodgers

Rodgers Hydraulic Inc.

7415 WALKER STREET • MINNEAPOLIS 16, MINN.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 228

SIGN SPAN: A new type of aluminum fabrication is being used in building highway sign spans. Supporting shafts are seamless, tapered aluminum; span is all-welded of individual sections. Tested under load of 60 pounds per running foot, the lightweight span offers high resistance to storm damage. **Pfaff & Kendall,** 84 Foundry St., Newark, N. J. Circle No. 53.

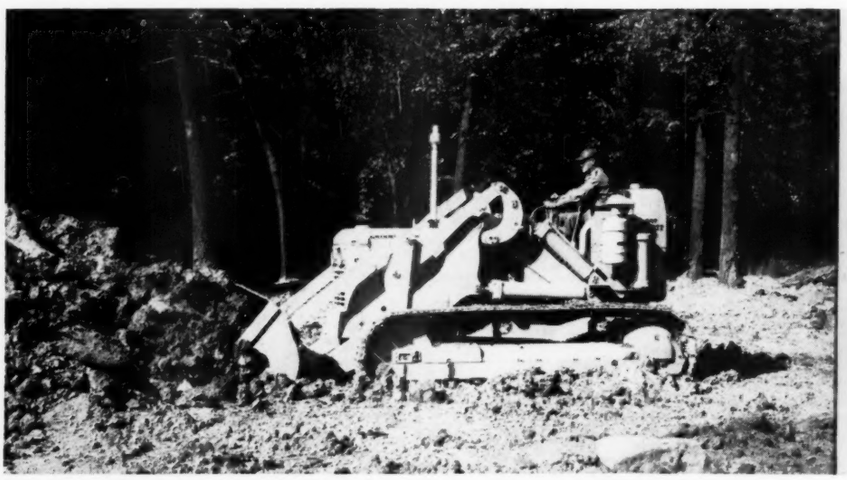


MACHINERY TRAILER: New feature simplifies loading, hauling of awkward, top-heavy machinery. Bed has been lowered by shifting axle to front; loading angle has been reduced about half. Bed may be moved back or forward over wheels; trailer serves as ramp for loading truck. Six-ton capacity; complete with brakes, lights, two-speed hand winch. **Buhl Machine Works,** Buhl, Idaho. Circle No. 50.

FLARE BEACON: Features a flashing bulb covered with red Fresnel lens of plastic. Power from standard 6-volt battery. Push-button switch; sturdy waterproof case. Designed for emergency and warning use by contractors, highway crews, etc. **U-C Lite Mfg. Co.,** 1050 W. Hubbard St., Chicago 11, Ill. Circle No. 59.

FUEL REGULATOR: On Guard regulator governs flow of gases from high-pressure cylinders which feed fuel to gas welding, cutting torches. Gage guard protects equipment from damage. Available in single and two-stage models. **K. G. Equipment Co., Inc.,** Dept. A., Box 538, Allentown, Pa. Circle No. 55.

SOIL-TESTING MACHINE: Hand operated unconfined compression apparatus for field, laboratory tests of soils. Employs mechanical screw principle. Eight-inch platen clearance also permits testing wood, metal. Load capacity: 500 pounds. **Soiltest, Inc.,** 4711 W. North Ave., Chicago 39, Ill. Circle No. 54.



1

Ample power and traction to "bury" the bucke

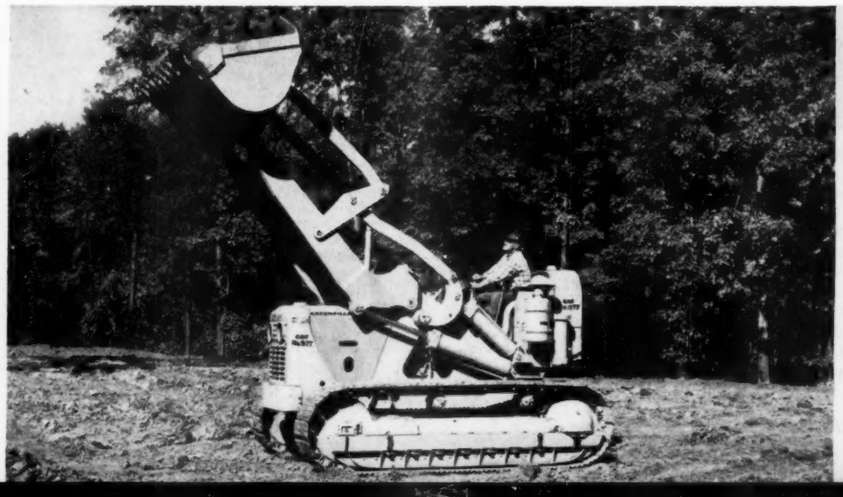
CATERPILLAR ANNOUNCES

THE NEW NO. 977T

Here's the new boss of the excavator-loaders...the new Caterpillar No. 977 Traxcavator. The No. 977 has important new features which greatly increase productivity and earning power.

FEATURES OF THE NO. 977 TRAXCAVATOR

- 96-in., 2¼-cu.-yd. bucket.
- 100 HP CAT* Engine, with ample power to "bury" the bucket and lift big loads.
- Newly-designed bucket tips back 40° at ground level to retain heaping loads.
- More than 11½ ft. of dumping height make it easy to load any truck or railroad car.
- Steel bumpers on lift arms allow rapid jarring of bucket, and 50° discharge angle helps to empty sticky materials fast.
- Automatic kick-outs put bucket in "hold" position at maximum height and position bucket for digging on next pass. Easier operation and faster cycle times.
- Advanced hydraulic system, with pump protected full flow filter.
- Hardened, spool-type operating valves located large tank, protected from dirt or damage.
- Long-lived, trouble-free oil clutch.
- Fast, one-hand bucket operation. High seat for co fort and visibility.
- Five forward speeds to 7.4 MPH; four reverse spee to 7 MPH.
- Each track controlled by heavy-duty dry multi disc steering clutch and contracting band brake.
- Tools for any job: 3-yd. bucket for light materi 9-tooth quarry bucket; heavy-duty bucket; skelet rock bucket; log and lumber fork.

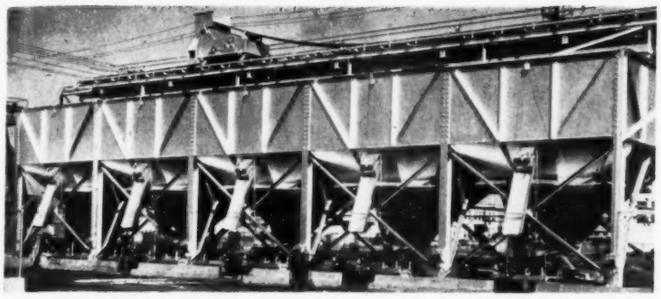


3

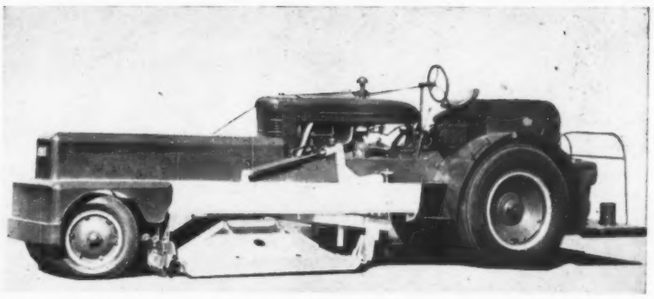
High lift, with over 11½ ft. of dumping height

4

Fast, ump nate



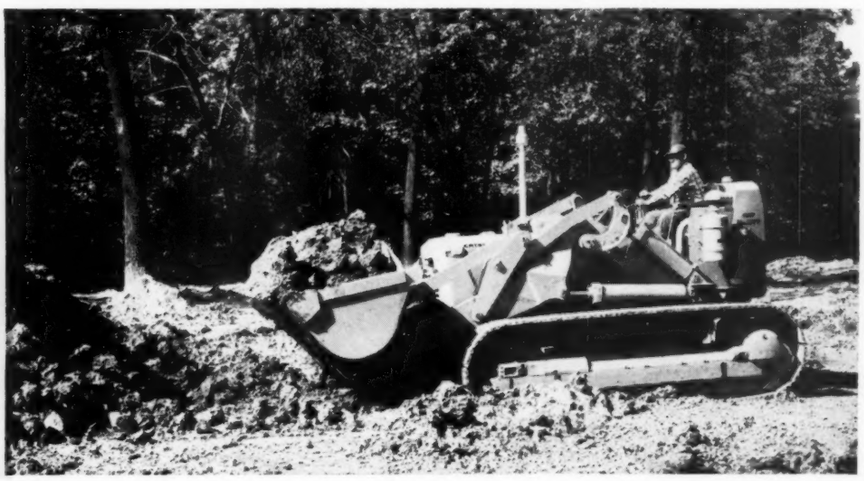
HOPPER VIBRATORS: Cleveland vibrators keep ingredients for asphalt mix on the move at this plant. Five LSFAC-type 3-inch models prevent arching, bridging of materials in 300-ton hoppers; two similar units prevent clogging in unloading hoppers; a 2-inch model prevents jamming on a chute. **Cleveland Vibrator Co.**, 2828 Clinton Ave., Cleveland, Ohio. Circle No. 52.



HEATER-PLANER: Generating intense heat without burning asphalt, this machine makes maintenance of asphalt streets, highways, roads, and airport runways simple and speedy operation. Burner under heating hood thoroughly softens asphalt; planing blade smooths out irreguiarities over a 78-inch width. **Monatco Mfg. Co.**, 1401 Woodland, Kansas City, Mo. Circle No. 51.

2

g° tip back
t ground level
hold load.



'77 TRAXCAVATOR*

MAIL TODAY!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

Please send full information about the new No. 977 Traxcavator.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

Now three sizes of Traxcavators are available for all your excavating and material-handling needs. They're *unit-built* machines, so efficient that you'll find they match or excel competitive equipment with nominally greater bucket sizes. You can choose the right Traxcavator for your job from the No. 933 (1 cu. yd.)—the No. 955 (1½ cu. yd.)—or the No. 977 (2¼ cu. yd.).

Let your Caterpillar Dealer show you how these new machines can make money and *save* money for you. Get complete information from him. Or mail the coupon.

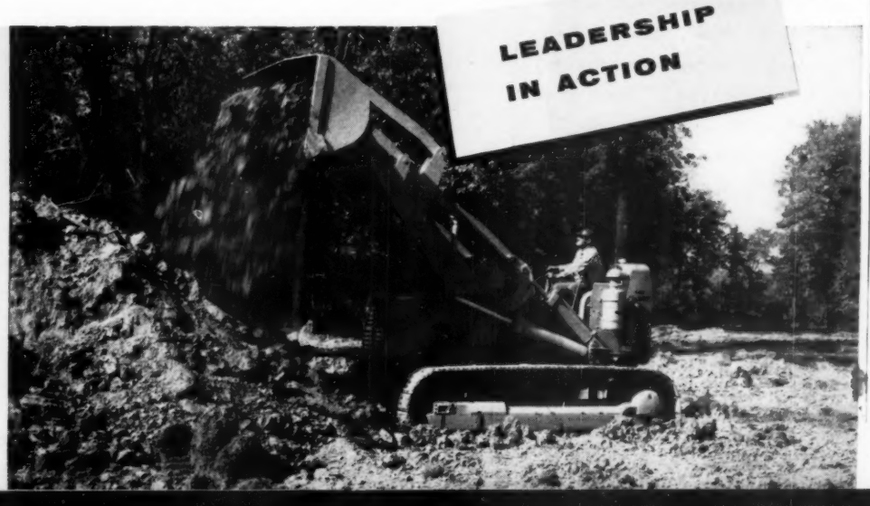
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

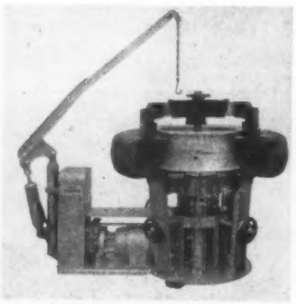
CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

4

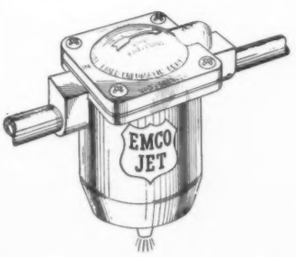
Fast, sure
dumping of sticky
materials.





LOCK RING BREAKER: Accessory for the Salsbury Tiremaster, this unit breaks top and bottom beads without rehandling of tire. Exerts 66,000 pounds pressure. Effective with tightly frozen tires; works in 3 to 5 minutes. **Salsbury Corp.**, 1161 E. Florence Ave., Los Angeles 1, Calif. Circle No. 57.

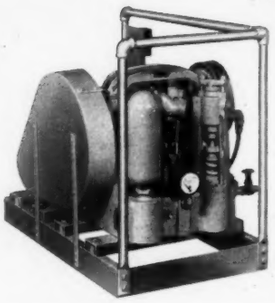
TRAILER SCRAPER: Two-wheel hydraulic scraper for International 300 tractor. Cacapity of ⅝ yard; uses 66-inch-wide cutting blade. Recommended for light excavation, leveling, cutting drainage ditches, cleanup work. **Shawnee Mfg. Co.**, 1947 N. Topeka Ave., Topeka, Kan. Circle No. 56.



AIR FILTER: Fully automatic, self-adjusting Emco Jet weighs only 12 ounces, has range of 1 to 20 cfm. Operating range: 60 to 250 pounds air pressure. Eliminates sludge, rust, moisture penetration. Easy maintenance. **Emco Pneumatic Corp.**, 1317-1319 Locust St., Des Moines, Iowa. Circle No. 58.

←For more facts, circle No. 229

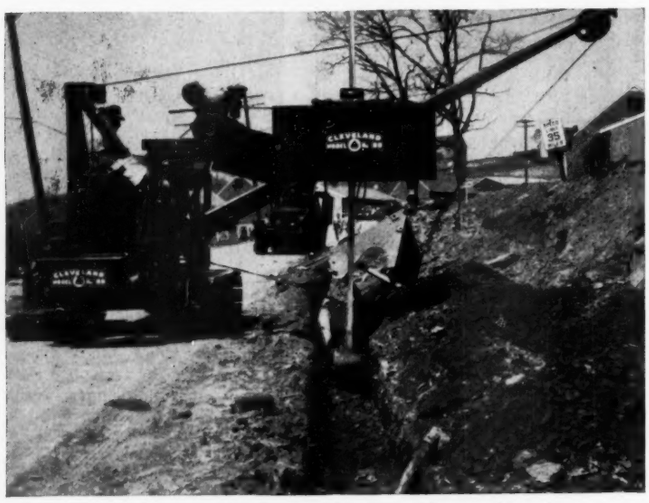
VIBRATORY COMPACTOR: The Road Packer, a self-propelled machine designed to work on macadam base courses, gravel subbases, and soil-cement bases. Compacts layers up to 12 inches thick in single pass. Six 420-pound shoes mounted between front and rear wheels provide vibrating and tamping action. Vibrating approximately ¼ inch, shoes cover a maximum 13-foot 1-inch width. Other features: hydraulic operation through a completely sealed system; good rubber-tire mobility of the machine; forward or backward operation. **Roadequip Mfg. Co.**, R. D. 2, Willoughby, Ohio. Circle No. 37.



PUMP UNITS: For easy, thorough cleaning of heavy equipment. Caster or skid-mounted units deliver up to 60 gpm at 800 psi; handle liquids, semi-liquid materials. Removes caked mud, grease, dirt quickly. Adjustable volumes, pressures. **Hardie Mfg. Co.**, Hudson, Mich. Circle No. 38.

TRANSIT-LEVEL: Features 3-foot short focus for close-quarters surveying. Internal-focusing 10½-inch telescope. Double verniers read to 5 minutes. Converts from transit to level quickly; locks in any position. **C. L. Berger & Sons, Inc.**, 37 Williams St., Boston, Mass. Circle No. 39.

Safe, smooth pipelaying on Pittsburgh utilities job—by Cleveland "80W."



Same job—same day—same "80W"—backfilling and tamping.

PIPELAYING, BACKFILLING and trench compaction, too, where needed—*each* done expertly by the Cleveland "80W." This modern machine substantially reduces equipment and manpower requirements on underground construction jobs of all types. That's why so many users equip *each* of their crews with a versatile "80W." Check its *complete* performance features—see how it fits your program—put it to work for you. You'll be money ahead when you do.

See your local distributor

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND

For more facts, use Reader-Reply Card opposite page 18 and circle No. 230

CHAIN SAW: Lombard Model DD features direct drive, positive automatic clutch, dependable all-weather starter, automatic chain oiler, special direct-drive saw-steel bar, pistol-grip handle. Special weight, cutting speed, and power advantages. Sixth in firm's family of chain saws. **Lombard Governor Corp.**, Ashland, Mass. Circle No. 40.

ENGINE-HOUR METER: Direct-reading meter available in 6, 12, 24, 32, 64, 110-volt models; three types of mountings. Black figures show operating hours of engine; red figure shows tenths of hours. Registers to 10,000 hours. **John W. Hobbs Corp.**, Division of Stewart-Warner Corp., 226 Yale Blvd., Springfield, Ill. Circle No. 41.

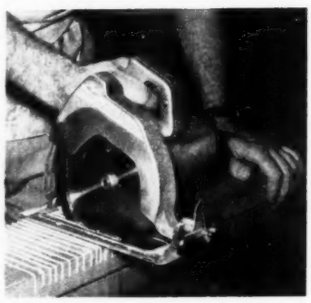
MAINTENANCE-FREE BATTERY: Called the Voltabloc, this nickel and cadmium unit is said to outlast any other battery on the market. Hermetically sealed; weighs less than conventional units; peak discharge rates to 20 times capacity of model. Sizes from 0.8 amp hours. **SAFT Corporation of America**, Gregg St., Lodi, N. J. Circle No. 42.

WALL FORM: A flat tie form, designed for use with the Symons flat tie. Available in sizes 6, 7, or 8 feet long; 30, 36, 42, and 48 inches wide. Strips by merely disengaging connecting bolts and hinging form away from wall. Galvanized strips prevent splitting of side rails; H-frame construction strengthens form. **Symons Clamp & Mfg. Co.**, 4249 Diversey Ave., Chicago 39, Ill. Circle No. 43.

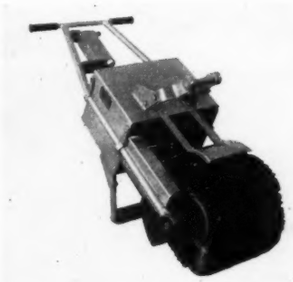
SYMON'S NEW FLAT TIE FORM

REVOLVING CRANE: This medium-capacity revolving crane features all-electric power. Individually-powered electric wheels; wide tires for flotation. Rig rated at 150 tons for lifting, spotting, carrying loads. Heavy cargo platform on front end provides room for load or counterweight. Electrically-powered outriggers controlled from cab. Diesel or gas engine coupled to electric generating system. **R. G. LeTourneau, Inc.**, Longview, Tex. Circle No. 44.

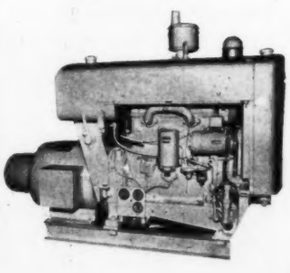
TRUCK CRANE: All-hydraulic operation distinguishes the H-5 Hydrocrane. As crane, will lift 9 tons; as excavator, handles ½-cubic-yard bucket. Uses standard two-piece boom or optional high-lift three-piece boom (extendable from 38 to 50 feet in length). Precision hydraulic control; patented outriggers. Mounts on conventional trucks. **Bucyrus-Erie Co.**, South Milwaukee, Wis. Circle No. 49.



POWER SAW: Lightweight circular model for cutting sheet metal, wood, other materials. Six and one-half-inch diameter blade; 25 to 60-cycle ac-dc motor with 115 volts (230 available). Maximum cut: 2 1/16 inches; bevel cut: 2 x 4's at 45 degrees. Weighs 7 pounds. **Mall Tool Co.**, 7725 S. Chicago Ave., Chicago, Ill. Circle No. 47.



POWER BRUSH: Speedlix brush cleans structural steel quickly, with considerable saving over old hand-wire brushing method. Westinghouse reversible 3-hp motor; sealed bearings. Eleven 1½-inch-wide wire brushes supplied, permitting variable brushing width. **Independent Iron Works, Inc.**, Eighth and Pine Sts., Oakland 20, Calif. Circle No. 45.



DIESEL-ELECTRIC GENERATORS: New line includes 40 models in speed ranges of 1,200, 1,500, 1,800 rpm. Four or six-cycle full-diesel engines; 12-volt starting system; automatic voltage regulators. Operator or remote-control starting. Series covers 8 to 35-kw range. **Universal Motor Co.**, 536 Universal Drive, Oshkosh, Wis. Circle No. 46.

TURBODIESEL ENGINE: Lightweight and rated at 175 horsepower, the JT-6 is recommended for vehicles in the 19,500-26,000-pound class. Turbocharging utilizes normally wasted energy to create added power. New cylinder head with two intake and two exhaust valves also improves performance. Bore: 4⅛-inches; stroke: 5 inches. Displacement: 401 cubic inches. **Cummins Engine Co., Inc.**, Columbus, Ind. Circle No. 48.

STANDARD ASPHALT PLANTS

MAKE ASPHALT FASTER—BETTER—CHEAPER, Because...

THE PLANT THAT'S *Paving the Nation*

Contractors throughout the nation recognize that STANDARD Asphalt Plants do the best job of filling their need for greater capacity, and faster production with practically no maintenance. Join the parade of profit and quality-conscious paving contractors... buy STANDARD ... the asphalt plant that does MORE for you and your customers.

no bottlenecks

Every unit of a STANDARD Asphalt Plant is engineered to speed the flow of materials, cut man hours per batch and to increase capacity.

EXTRA-LARGE DRYER CAPACITY

Size-for-size, STANDARD dryers out-perform all others in capacity and efficiency. Internal design permits *more* aggregate to be exposed *longer* to *more* heated air.

OVERSIZED ELEVATORS

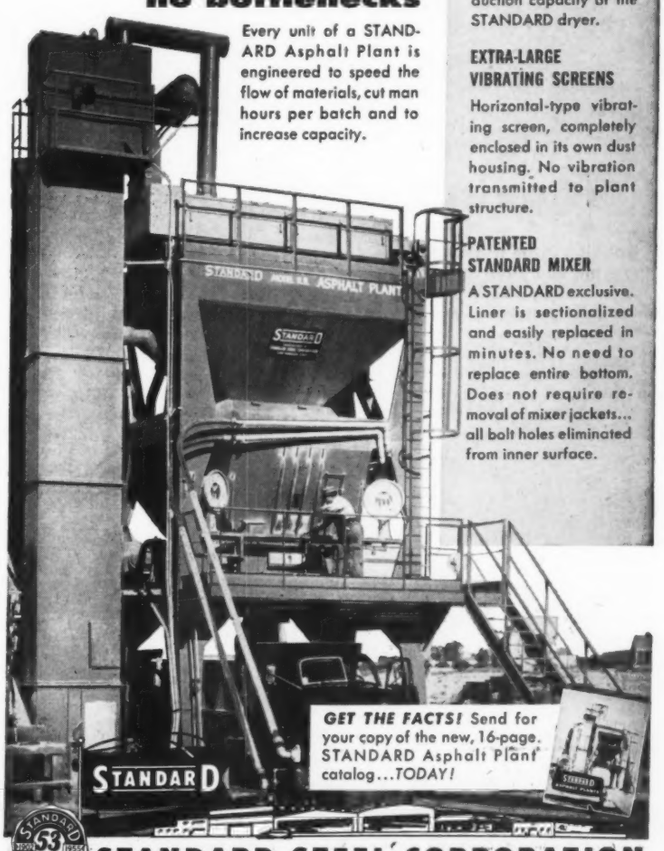
Elevators are of the vertical type with an extra-wide margin of capacity. Designed to handle the greater production capacity of the STANDARD dryer.

EXTRA-LARGE VIBRATING SCREENS

Horizontal-type vibrating screen, completely enclosed in its own dust housing. No vibration transmitted to plant structure.

PATENTED STANDARD MIXER

A STANDARD exclusive. Liner is sectionalized and easily replaced in minutes. No need to replace entire bottom. Does not require removal of mixer jackets... all bolt holes eliminated from inner surface.

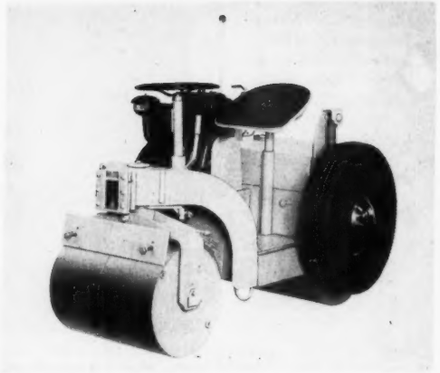


GET THE FACTS! Send for your copy of the new, 16-page STANDARD Asphalt Plant catalog...*TODAY!*

STANDARD STEEL CORPORATION
5007 Boyle Avenue, Los Angeles 58 • 15 Park Row, New York 7

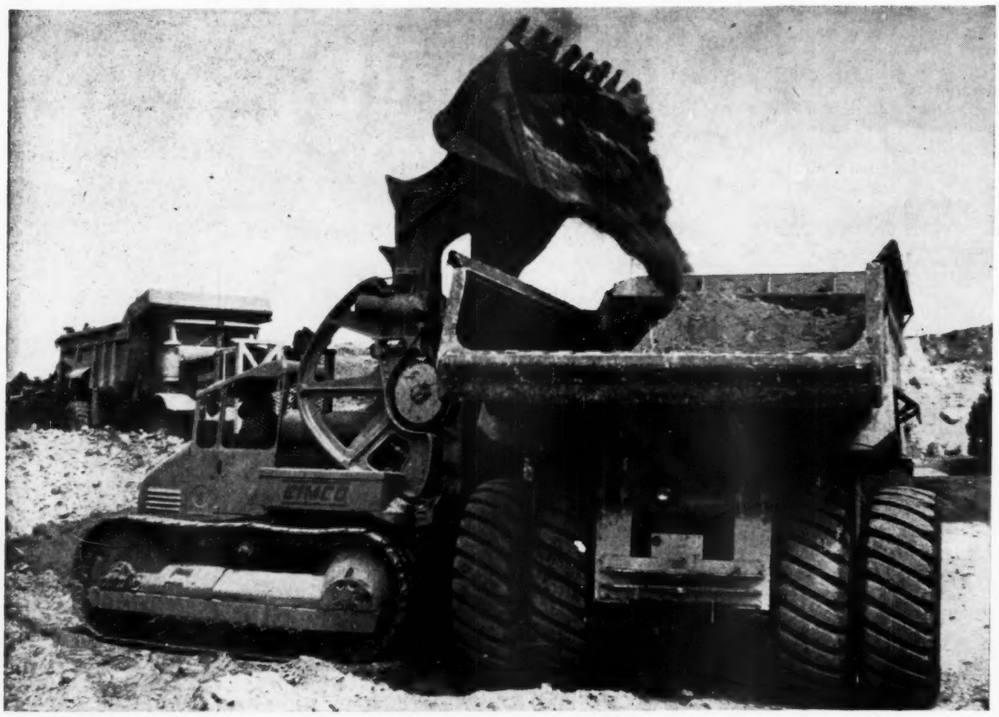
For more facts, use Reader-Reply Card opposite page 18 and circle No. 231

COMPACTION SCREED FINISHER: Features one-pass performance. Six forward, six reverse, four independent screed speeds. Screeds 16 inches wide. Portable, nonportable models. **General Road Machines, Inc.**, Niles, Ohio. Circle No. 74.



POWER ROLLER: Western Duty Delux roller in 1, 1½, 2-ton models. Heavy steel plate, channels in 24 x 32-inch rear rolls. Works within ¾ inch of walls, curbs. **Western Welding & Mfg. Corp.**, 2025 W. Clybourn St., Milwaukee 3, Wis. Circle No. 72.

TRUCK-BED COVER: One-piece molded plastic cover. Converts ½ or ¾-ton open-bed pickup to panel-design truck. Protects materials in transit. Fiber glass construction. Three basic designs. **Eastern Glas Laminates, Inc.**, Meyersdale, Pa. Circle No. 73.



Moving High Tonnage at Low Cost

Loading large trucks at this huge open pit operation at the rate of approximately 2800 tons per 8 hour shift is moving tonnage at a very low cost.

This tonnage will be increased in the next week or ten days to approximately 4000 tons per 8 hour shift as the operators become experienced with the Eimco 105.

The trend to smaller, highly mobile, less expensive excavators is understandable. Tough, heavy-duty units like the Eimco 105 will actually out produce the larger, cumbersome, slow moving predecessors and the cost of these smaller units is only a fraction of the cost of larger boom type equipment with the same or even greater bucket capacity.

If you are interested in production-and-costs, the following suggestions will be interesting to you:

1. **Investigate the Eimco 105 and get a list of users who are working in conditions similar to your own.**
2. **Check the Eimco 105 against any other equipment doing a similar job and ask users their opinions.**
3. **Check with other manufacturers who offer equipment for the same work and see how the prices compare.**

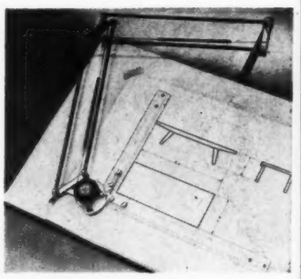
Eimco will be glad to have one of their engineers answer questions you may have about the Eimco Tractor.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-155



DRAFTING MACHINE: For any graphic operation requiring T-square and triangle. Accurate, sturdy, portable. **Walpole Co.**, 419 Boylston St., Boston, Mass. Circle No. 76.

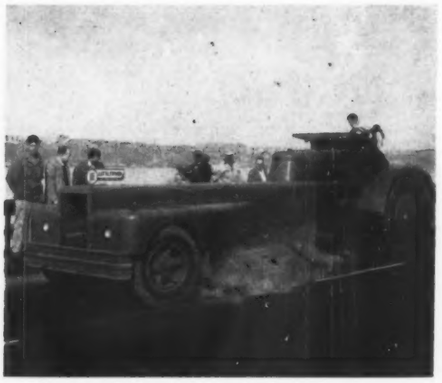
THREAD INSERTS: Stainless steel wire thread for equipment repair. Kit contains inserts, tools. Sizes range from 6-32 to 1½-6 in NF and NC series. Economical. **Heli-Coil Corp.**, 1496 Shelter Rock Lane, Danbury, Conn. Circle No. 79.

CIRCULAR SAW: Bench-model tilting-arbor 10-inch unit. Cuts up to 3⅛ inches; weighs about 200 pounds. Powered by 1-hp motor. Combines with Delta 6-inch long-bed jointer. **Rockwell Mfg. Co.**, Delta Power Tool Div., 443 N. Lexington Ave., Pittsburgh, Pa. Circle No. 80.

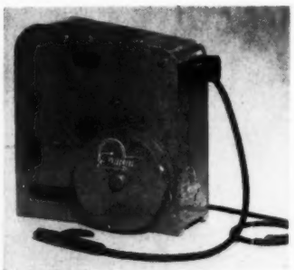
For more facts, use Reader-Reply Card opposite page 18 and circle No. 232

CULTIVATOR-AERATOR: For grass-divided highways. Fits 3-point-suspension hydraulic-lift tractors. Trac-Lift has eight cultivating wheels, three different knives and tines. Width: 6 feet. **Soilaire Industries,** 1208 Second Ave. S., Minneapolis 3, Minn. Circle No. 70.

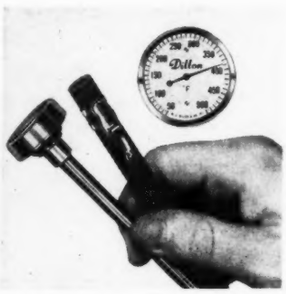
MATERIAL CONVEYOR: Marion Mule has self-raising boom hoist; double-braced boom; worm, gear transmissions. Flat riding surface for materials. Comes in 22, 32, 42-foot lengths. Sideboards for wide materials. **Marion Mfg. Co.,** Marion, Ohio. Circle No. 463.



HEATER-PLANER: Littleford Clark-Moore machine melts asphaltic-concrete wearing surface, smooths it with grader-type blades. Smooth-faced rear tires increase traction. **Littleford Bros., Inc.,** 485 E. Pearl St., Cincinnati, Ohio. Circle No. 75.

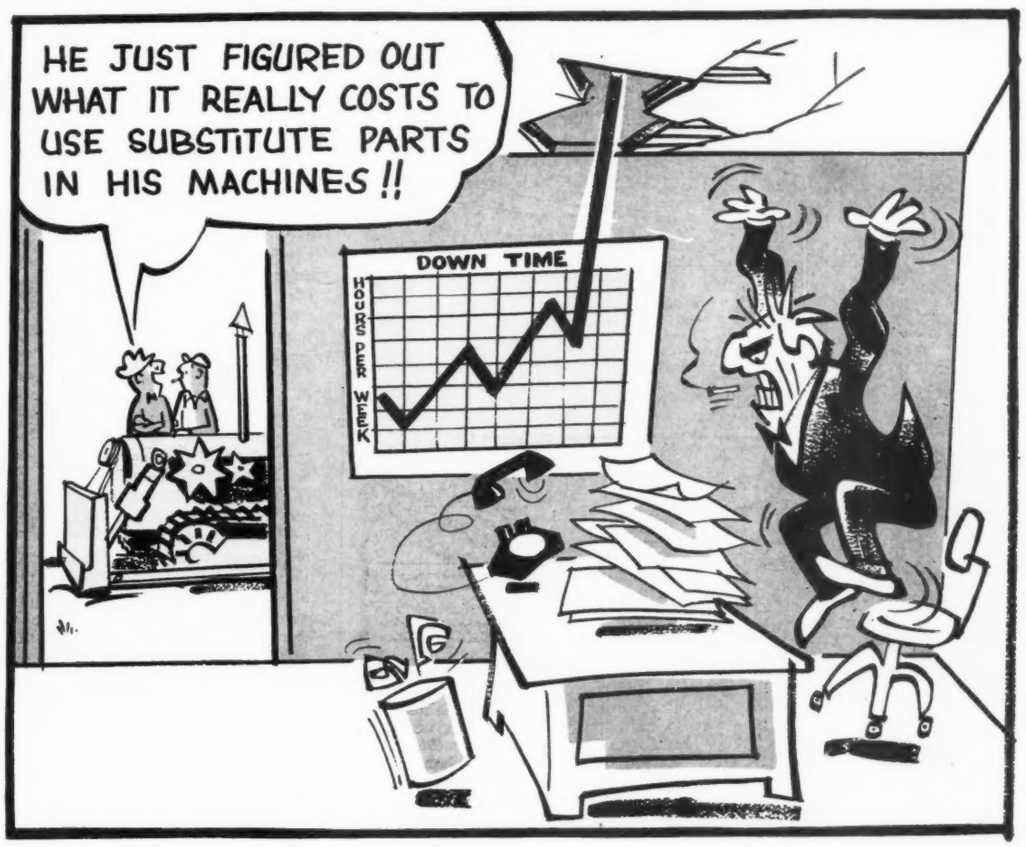


WELDING-CABLE REEL: Handles 100 feet of 2/0 cable at 300 amps. Retracted by heavy-duty spring and gear mechanism. **United Specialty Corp.,** Box 698, El Dorado, Ark. Circle No. 78.



MIX THERMOMETER: Pocket-sized, stainless-steel unit with range of 50 to 500 degrees F, checks temperature of asphalt mixes. Dial diameter: 1 inch; stem length: 5 inches. **W. C. Dillon & Co., Inc.,** 14620 Keswick St., Van Nuys, Calif. Circle No. 77.

TIRE CHANGER: Hydraulically powered; changes tubeless, conventional tires. T0-100 consists of frame, ram, hydraulic pump. Metal spacers hold tire away from flange. Recommended for tubeless earthmover tires. **Goodyear Tire & Rubber Co.,** Akron 16, Ohio. Circle No. 81.



Down time is no joke.

But it happens at times when track hardware gives out.

If you replace with original Caterpillar hardware, here's what you're sure of: bolts, nuts, capscrews and lock washers made from prechecked fine-grade steels, carefully hardened and tested, finished to the strictest specifications in the industry. You're sure of longer wear life, no matter how tough your jobs come. You're sure of *less* down time in the future.

If you replace with substitute hardware—can you be sure of anything?

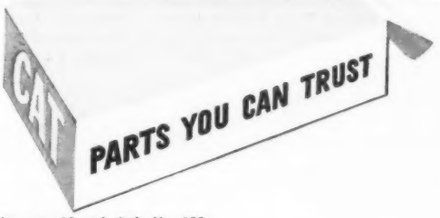
Better get Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

On the surface, CAT® hardware looks like ordinary kind. But etched cross section of newly designed track bolt (left) shows depth of special "Hi-Electro" hardening penetration in bolt head.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 233

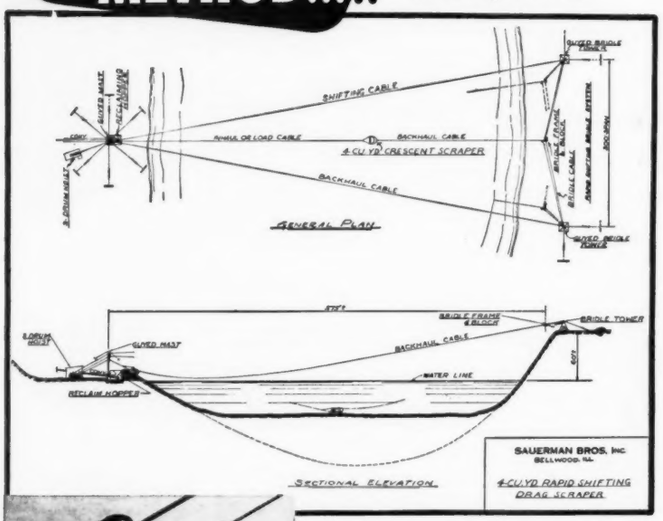
REDESIGNED CRAWLER: New International TD-18A. Drawbar horsepower of 103; 24,300 pounds drawbar pull. New power-train gearing, self-energizing brakes. **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill. Circle No. 82.

MOBILE CRANE: Operates over rough terrain; lifts 80,000-pound load; boasts travel speeds to 40 mph. Reaches 30 feet; lifts 32 feet. Electric power, controls. **LeTourneau-Westinghouse Co.**, 2301 N. Adams St., Peoria, Ill. Circle No. 83.

SALT SPREADER: Model 55 Salt Miser clamps to tailgate of standard dump truck body. Power from air-cooled 2-hp engine. For effective ice control on roads, streets. **Baughman Mfg. Co., Inc.**, Shipman Road, Jerseyville, Ill. Circle No. 87.

the SAUERMAN METHOD.....

Scraper Machines Engineered to Your Operation



Above drawing was prepared for a specific drag scraper installation and does not represent maximum spans.

View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.

•

Contact Sauerman's engineering department for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers—24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

The Sauerman Method works equally well over widely differing areas and span limits . . . on hills, swampy ground or underwater . . . handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

Operating costs are lower—basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads—not dead weight. When expendable parts—sheaves, clutch or brake linings—are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

SAUERMAN BROS. INC.
616 S. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

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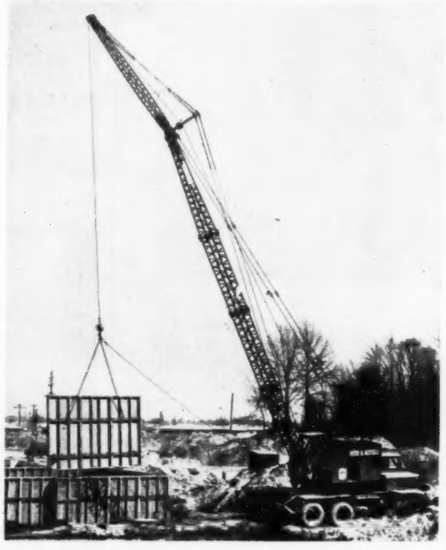
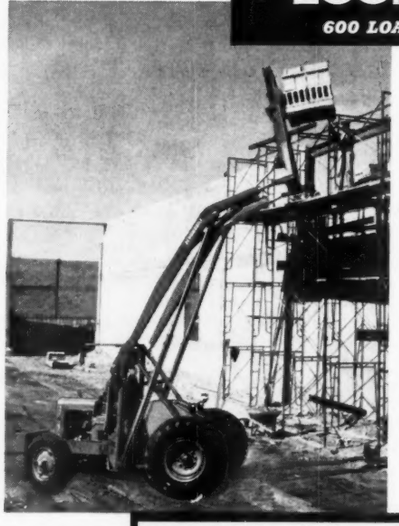


TRUCK CRANE: Lorain-Dixie, made, sold, serviced by Thew-Lorain. Low center of gravity gives this 6-ton crane exceptional stability. New hydraulic control system includes master cylinder for each working part, eliminating downtime because of central booster-pump failure. Standard 25-foot boom; 5 and 10-foot boom inserts and 15-foot jib and gantry available for long-boom work. Economy of maintenance. Available on rubber-tire crane carrier; also mounts on 2½-ton truck or 20-inch crawlers. Travels road at full truck speed. Standard power unit is International Harvester V-162 gasoline engine; Continental F-162 gasoline engine or diesel power unit available on order. More than 16 types of attachments, including slings, hooks, grabs, grapples, buckets. **Dixie Crane & Shovel Co., Inc.**, Ravenna, Ohio. Circle No. 85.

automatic self-leveling?

the ECONMOBILE 600 LOADER *has it!*



The ECONMOBILE's integral automatic self-leveling feature is only one of many that already have made this high-lift, hydraulic loader a favorite of the construction world.

Consider these factors: The ECONMOBILE's lift of 18 feet—or 22 feet with auxiliary tower; its reach of up to 6 feet from wheel to heel; its mobility and speed; its 90% use factor with a wide range of attachments.

It's not surprising that one contractor reported his ECONMOBILE served 68 masons with only 8 general laborers.

write, wire or call

AMERICAN ROAD EQUIPMENT COMPANY
4310 North 28th Street Omaha, Nebraska
Phone PLeasant 2575

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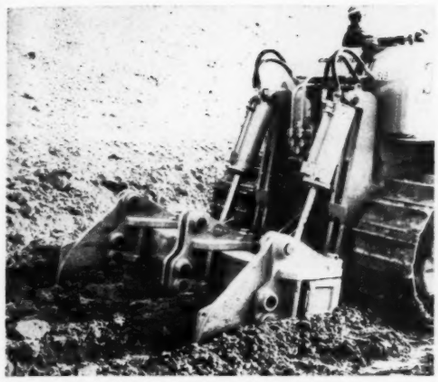
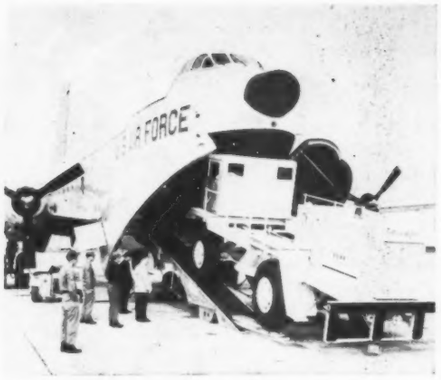


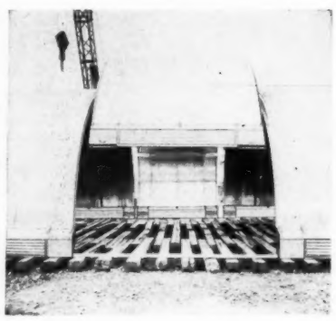
ROCK RIPPER: Extra-heavy unit designed for Caterpillar D9. Ripping depth of 26 inches with standard ripper shank, 30 inches and up with special shank. **American Tractor Equipment Co.**, 9131 San Leandro Blvd., Oakland 3, Calif. Circle No. 84.

SWING LOADER: New Speed Swing has 180-degree swing, 30-degree bucket tilt-up at ground level. Full 5,000-pound capacity as front-end loader. Big loads in limited quarters. **Pettibone Mulliken Corp.**, 4700 W. Division St., Chicago 51, Ill. Circle No. 86.

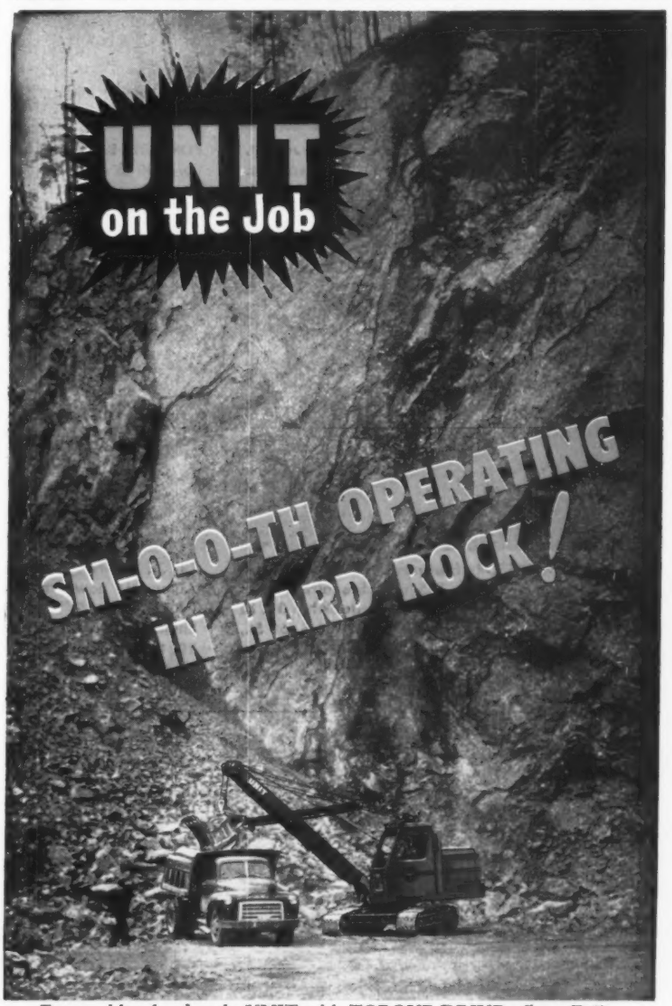


SNOW-REMOVAL UNIT: Snowplow Carrier being shipped by air. Moves at speeds to 40 mph. Plow cuts 16-foot swath; plow engine is 810-hp tank engine; carrier powered by 330-hp gas engine. **Dart Truck Co.**, 2621 Oak St., Kansas City 8, Mo. Circle No. 88.

POWDER-CUTTING NOZZLE: Permits cutting concrete with a standard powder-cutting blowpipe. Makes clean, straight cuts horizontally or vertically. Addition of metallic powder to oxyacetylene cutting flame increases temperature, also speed and range of cutting action. **Linde Air Products Co.**, Division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. Circle No. 89.



STORAGE SHELTER: Sections built in 8-foot wide prefabricated panels combine to make up shelters for equipment, materials. Easily handled, bolted together. All-welded construction; double-V rubber seal for joints. Six designs for shelters to meet various storage needs. Available either for purchase or for rental. **Yard-Stor Shelter Co.**, 19256 John R. St., Detroit 3, Mich. Circle No. 90.



For working hard rock, UNIT with TORQUE DRIVE offers: Full, steady power without stalling engine— Increased lugging power — Elimination of shock loads on machinery. Investigate these advantages and other UNIT features. Write for Bulletin No. U-1153.

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6309 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

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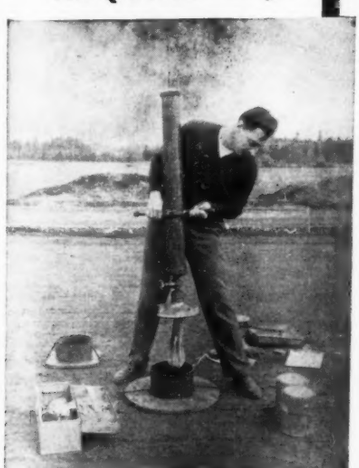
ENGINEERED HIGHWAYS REQUIRE→



The unit is light in weight, compact, very portable, easy and economical to operate and maintain.

WASHINGTON **Dens-o-meter**

THE KEY TO ACCURATE FIELD TESTS FOR MOISTURE DENSITY IN EMBANKMENT AND FOUNDATION SOILS.

Developed after two years research and experiment by Department of Highways, State of Washington. Opens up entirely new possibilities for foundation and earth work engineers and contractors who can now make accurate moisture-density and compaction tests.

- in all large or small holes
- in all types soils and granular base materials
- in about 3 minutes after hole is dug

Now for the first time, holes of any size from 0.000 cu. ft. to 0.500 cu. ft. can be measured with the same equipment. Holes up to 22 inches in depth can be measured—singly or in successive lifts.

Get full information from

Exclusive Sales Agents

CHARLES R. WATTS CO.
4121 SIXTH AVENUE NORTHWEST
SEATTLE 7, WASHINGTON

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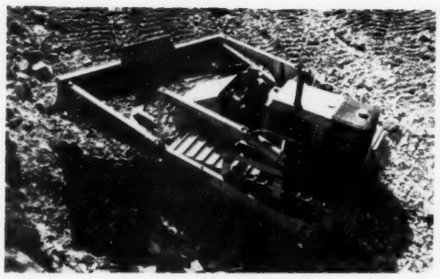
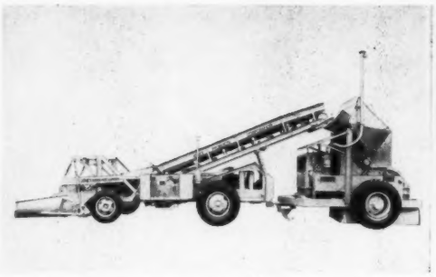


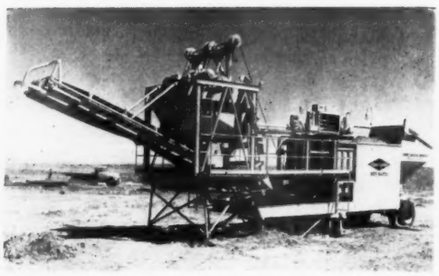
TRACTOR-LOADER: Eimco 105 works as tractor with straight, angling hydraulic or cable dozer blades; as versatile loader. Has 124-hp diesel, converter. **Eimco Corp.**, 654 S. Fourth West St., Salt Lake City 10, Utah. Circle No. 91.

TANDEM ROLLER: Has torque-converter drive as standard equipment to maintain roller speed regardless of grade. Three axles; twin guide rolls. Weight range, 14 to 20 tons; speeds, 0.8 to 5.5 mph. **Galion Iron Works & Mfg. Co.**, Galion, Ohio. Circle No. 98.



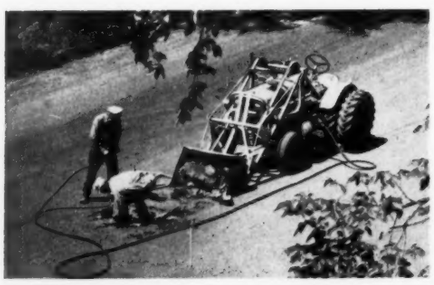
LOADER-BREAKER TEAM: Handles 50 to 200 tons hourly. Cat D315X diesel powers breaker; 113-hp engine operates feeder, belt. Loads at 0.026 to 1.74 mph; travels 3 to 20 mph. **Athey Products Corp.**, 5631 W. 65th St., Chicago 38, Ill. Circle No. 95.

NEW TRUCKS: Transtar line includes this 2-ton model. Heavy-duty units have stronger frames, rear springs. V8 156-hp engine standard; 175-hp engine optional. Body lengths: 9 to 14 feet. **Studebaker-Packard Corp.**, South Bend, Ind. Circle No. 96.

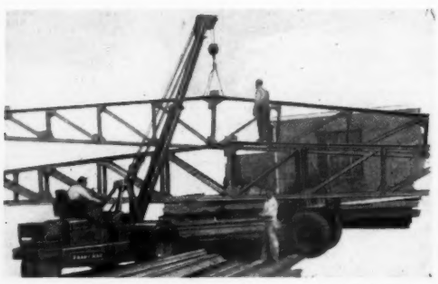


PORTABLE BATCHER: Can be towed on highways, set up in 30 to 45 minutes to turn out 40 cubic yards per hour. One-man operation. "Dry Batch" weighs ingredients separately. **Auto-Crete Co.**, 612 Security Bldg., Phoenix, Ariz. Circle No. 97.

MATERIAL-STORAGE UNIT: Corrugated steel; wood flooring. Length, 42 to 128 inches; width, 45 inches; height, 50 inches. Trailer unloads unit by driving out from under. **Material Master, Inc.**, 3508 W. Irving Park Rd., Chicago 18, Ill. Circle No. 94.



TRACTOR-COMPRESSOR: Features increased air output ranging from 105 to 125 cfm. Econotrol varies engine speed to match air demand. Tractor hp: 35. **Le Roi Div.**, Westinghouse Air Brake Co., 1706 S. 68 St., Milwaukee 14, Wis. Circle No. 474.



TRUCK CRANE: Front-wheel drive, rear-wheel steer. Automatic power cut-off. Self-stabilizing. Available in 1½, 2½, 5, 10, and 12½-ton-capacity models. **Silent Hoist & Crane Co.**, 841-877 63rd St., Brooklyn 20, N. Y. Circle No. 93.

AUTOMATIC CLUTCH: Has moving parts that cannot jam or ice. Prevents frozen material from being spread. Clutch slips when excessive load is placed on truck motor. **Mercury Clutch Div.**, Automatic Steel Products, Inc., Canton, Ohio. Circle No. 92.

NOW
OVERHEAD PLUS
FRONT-END LOADING
COSTS NO MORE
with
LODOVER!

This versatile combination overhead and front-end loader costs no more than conventional front-end loaders . . . yet loads *more* dirt, *faster* with your International T-9 or TD-9 than any other loader on the market today!

ONLY LODOVER GIVES YOU

50% MORE YARDAGE—no-turn overhead operation eliminates two turns every cycle, doubles yardage every hour

EXTRA DIGGING POWER—twenty-five degree bucket tilt-back at ground level pries out a full bucket every time

REDUCED TRACTOR MAINTENANCE • SAFE, EASY HYDRAULIC OPERATION • HIGH-SPEED FRONT-END LOADING

A complete line of job-tested attachments makes Lodover the most versatile multi-purpose unit you can buy to boost profits on your job. An on-the-job Lodover demonstration will convince you . . . arrange for one today!

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Haul Larger Legal Payloads

FASTER . . .
EASIER . . .
CHEAPER . . .

With an OMAHA STANDARD CENTER DUMP TRAILER!

Lower initial cost—less maintenance—faster unloading time—increased payloads. Put an Omaha Standard Center Dump Trailer on the job, and let gravity do the work.

Throughout the United States and Canada, hundreds of contractors are using Omaha Standard Center Dump Trailers for hauling, dumping, spreading and stockpiling all types of flowing materials; — dirt, gravel, shale, rock, sand, chemicals, cement, etc. And they find that it quickly pays for itself.

The Omaha Standard Center Dump Trailer is designed and built to give you greater production at less cost — conforms with all state bridge and axle laws. Illustration shows 10-yd. trailer. Built in all yardages, for any material, single or tandem, for on or off highway. Also available with cross-flow hoppers for spreading. Tell us your problem. Write now for full information.

OMAHA STANDARD
FACTORY AND GENERAL OFFICES
2401 W. Broadway
COUNCIL BLUFFS, IOWA

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FINEGRADER: Special Grade-A-Curve feature permits cutting grade accurately without stopping machine. Hinged I-beam structural frame raises to cut crown, lowers to cut on level as rig moves along. Holds grade to within 1/10 of 1 per cent on all sections. Available on Buckeye finegraders. **Gar Wood Industries, Inc.,** 36253 Michigan Ave., Wayne, Mich. Circle No. 101.

CONCRETE-GUNNING RIG: Consists of Bondactor concrete gun, Mix Elevator mounted on small trailer. Auger-type mixer takes materials from proportioning chute; bucket elevator deposits concrete in hopper over Bondactor. Gun shoots concrete by means of compressed air. Separate air and water lines connect with nozzle. Available in models with capacities of ¾ to 3 cubic yards per hour. **Air Placement Equipment Co.,** 1011 W. 24th St., Kansas City, Mo. Circle No. 103.

SCRAPER UNIT: Rubber-tire unit carries 60-ton payloads at speeds to 35 mph. M-R-S tractor is 500-hp prime mover; Wooldridge OS-300B scraper is equipped with broadbase tires for extra-high flotation. High maneuverability. **M-R-S Mfg. Co.,** Box 1206, Jackson, Miss. **Wooldridge Mfg. Div.,** Continental Copper & Steel Industries, Inc., Sunnyvale, Calif. Circle No. 100.

TRUCK-MIXER: New models feature shortened center of gravity, reduced weight, three-speed transmission with single-lever control. Standard sizes from 3½ to 8½ cubic yards. Improved open-end loader with enlarged throat. Larger discharge blades for faster charging. **Jaeger Machine Co.,** 550 W. Spring St., Columbus 16, Ohio. Circle No. 102.

Heavy-Duty FLOOD LAMPS

For Better Light • Longer Service • Lower Cost

Especially Designed for Efficient Service on

Shovels • Excavators • Drag-Lines • Roadbuilding Equipment Locomotive Cranes • Tractors . . .

Metal Spinning Division

PHOENIX PRODUCTS CO.

4727 N. 27TH ST. • MILWAUKEE 16, WIS.

Write for Illustrated Bulletin.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 240

NEW

Carbide Bonded* Blades...

...cut costs 51%

It took Consolidated Diamond Tool to successfully put together DIAMONDS . . . the hardest, most durable natural stone, and CARBIDE . . . the toughest, most enduring of man-made metals. Result . . . the amazing Consolidated carbide-bonded, diamond, concrete saw blade.

Careful analysis of field reports and tests, conclusively show the new Consolidated blade lasts 2 to 3 times longer than conventional diamond blades. Longer blade life means lower costs . . . lower costs mean lower bids . . . lower bids mean more contracts.

In the last four months, 7 out of every 8 sawing contractors, for whom performance tests were conducted, adopted the new Consolidated blade immediately.

Write today for complete information and prices.

LEADING SPECIALISTS IN TUNGSTEN CARBIDE RESEARCH AND MANUFACTURE

Consolidated

DIAMOND TOOL CORP.

320 Yonkers Avenue, Yonkers, N. Y.

*Patents Pending.
**Detailed New York International test available on request.

CONCRETE AND MASONRY CUTTING BLADE DIVISION

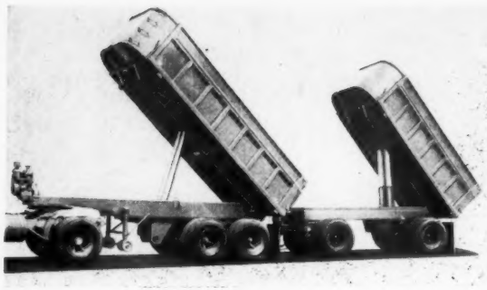
For more facts, use Reader-Reply Card opposite page 18 and circle No. 241

AERIAL TOWERS. Hydraulic, operator-controlled Strato-Tower. Mounts trucks, flatcars. Platform heights: 30, 45, 60 feet. **Elkhart Welding & Boiler Works, Inc.**, 2132 S. Main St., Elkhart, Ind. Circle No. 104.

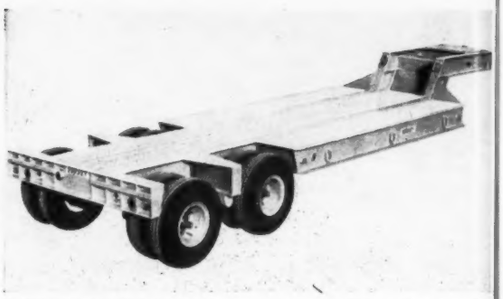
DRILL BITS: Series 600-thread Rok-Bit. Four sizes: 3½, 3, 2¾, 2½-inch. Five air holes. **Brunner & Lay, Inc.**, 9300 King St., Franklin Park, Ill. Circle No. 105.

OIL FILTERS: Hevi-Duty filters with double center tube. Heavy-gage drawn steel. Bar-type cover handle instead of bolts. **Wix Corp.**, Gastonia, N. C. Circle No. 106.

TIE-WIRE DISPENSER: Attaches to user's belt. Allows up to 480 ties per hour. For right or left-handed use. **Ideal Reel Co.**, 328 Harahan Blvd., Paducah, Ky. Circle No. 107.



TRAILER DUMP: New tandem-axle trailer dump for use with single-axle tractors. Self-powered hydraulic hoist. Complete hydraulic system including auxiliary engine, pump, spool-type control valve, oil reservoir. Duo-scopic hoist cylinders. Model STM (SP) powered by 15 hp, two-cylinder, air-cooled gasoline engine. Electric starting optional. Capacity: 10 to 36 cubic yards or 24 to 34 tons. Clutch-equipped gear-reduction unit part of engine assembly. **Galion Allsteel Body Co.**, Division of Hercules Galion Products, Inc., Galion, Ohio. Circle No. 108.



LOW-BED TRAILER: High-tensile steel construction. Deck length of 14 feet. Weighs at least one ton less than other units in 15 to 35-ton-capacity range. Reduced length, weight allow greater legal loads. Flat-type gooseneck for transporting blades, shovels, also adapts to ramp for motor graders without increasing over-all length. Gooseneck incorporates tool box. Standard equipment includes air or vacuum brakes, hardwood floor, rear-loading ledge. Fully equipped Model HTS-20 weighs 8,250 pounds. **Dorsey Trailers**, Elba, Ala. Circle No. 109.

Compact low and narrow

It's the NEW 155 Trenchliner®

Look at the low profile of this small 155 Parsons Trenchliner! Working height is only 7 feet-4 inches. This lets it dig under trees, overhanging branches and other overhead obstructions where larger trenchers can't go. Width over crawlers is only 5 feet-4 inches for work and travel between buildings, in narrow alleys, and other restricted operating areas. Close side-clearance puts trench within 21 inches of walls, poles, fences. Spoil conveyor dodges side obstructions without swerving from grade-line — shifts through machine by power in less than 1 minute. Belt direction is instantly reversible, places spoil bank on either side of trench.

For all its compactness, this utility-size 155 offers a big "plus" in work capacity. It digs 16 to 26 inches wide — 8 feet deep. You get 30 digging speeds (60 optional) from 5.8 inches up to 25 lineal feet per minute. Low rang lets the 155 "inch" its way past cross-pipes, through ro and other underground obstructions. High range giv maximum feet per minute on cross-country trenchin

Sloping ladder-boom undercuts walks, curbs, gutte makes vertical set-ins flush with main lines or foundati walls. Positive down-crowd with hydraulic control sta cut fast, maintains accurate grade. In fact, this 155 h all the heavy-duty characteristics of larger Parso Trenchliners. It has cast-steel buckets, "Tap-In" tee spring-cushioned bucket-cleaner, enclosed gearing, tra tor-type crawlers with 16-inch grouser treads or 12-in flat shoes, choice of gas or diesel power. Have yo Parsons distributor demonstrate what this new 1 Trenchliner can do for you — call him today.

Want more facts? *Send for* ☐ *spec. sheet* ☐ *bulletin on 155 Trenchliner*

NAME_____ TITLE_____

COMPANY_____ DIV._____

STREET_____

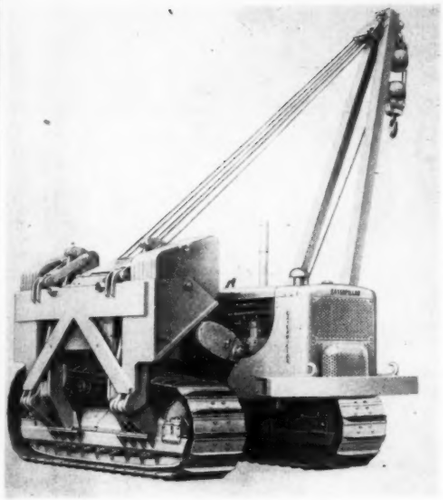
CITY_____ STATE_____

CP633 C&E

PARSONS COMPANY

NEWTON, IOWA

(Koehring Subsidiary)



PIPELAYER: Single unit consisting of tractor and integral boom. Lifting capacity is 130,000 pounds. No. 583 weighs 39 tons. Ground clearance: 21 inches. Powered by 6-cylinder engine, with 190 hp at 1,200 rpm. Three-speed transmission. Three-stage 5:1 torque converter. **Caterpillar Tractor Co.**, Peoria, Ill. Circle No. 110.

PORTABLE POWER PLANT: Four models of ac power plant in 1,000, 1,500, 2,500, 3,500-watt sizes. Weight range: 90 to 280 pounds. Powered by Briggs & Stratton 4-cycle engines. Manual starting only. Outlet receptacles and carrying handles. Adaptable to emergency use. **Katolight Corp.**, Box 891, Mankato, Minn. Circle No. 111.

TRAVERSE SAW: Jet 110 cuts stone, marble, brick, concrete products, etc., on the job. Wheel diameter: 14 inches. Cuts 5-inch maximum depth on surfaces 9 or more feet long. Universal 115-volt ac-dc motor of 25 to 60 cycles. Vacuum cooling system; helical gearing. **Stone Machinery Co.**, Manlius, N. Y. Circle No. 112.

Parsons rubber-tired 88 renchmobile® drives job to job under its wn power at 12.6 m.p.h. — maintains fast hedules. Digs 14½ feet of trench per min-e, 8 to 16 inches wide; depths to 5 feet.

Get 3-tool versatility with Kwik-Mix Moto-Bug®

Big R-15 Moto-Bug hauls all kinds of bulk materials in 15 or 18-cubic foot hopper body. Hopper is quickly interchanged wtih 1-ton capacity platform, or ¾-ton (7-foot) fork lift. There's no limit to its usefulness — earns big savings in time and costs. Ask, too, about smaller S-10 Moto-Bug, available with multiple attachments. Kwik-Mix line also includes concrete mixers, plaster-mortar mixers, bituminous mixers — all sizes and types.

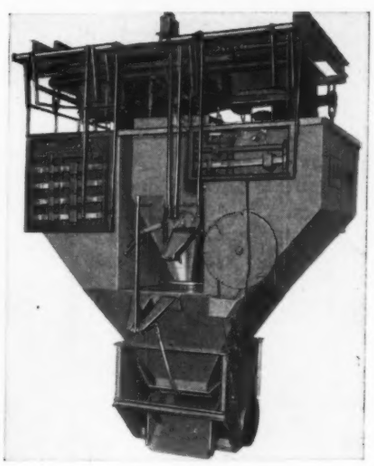
KWIK-MIX · Port Washington, Wis.
(Koehring Subsidiary)

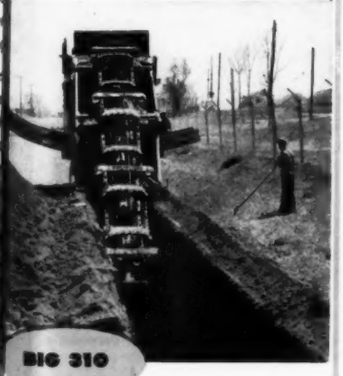
This general-purpose 250 renchliner produces up to 9¾ lineal feet of lean-cut trench per minute. Widths, 16 to 2 inches. Depths to 12½ feet. Discharges ell beyond edge of trench, or loads trucks.

Central cement feed prevents "gumming"

With concentric arrangement of aggregates around cement in the Johnson Concentric Batcher, all ingredients are intermingled as they flow through discharge. Reduces dusting, pre-shrinks materials. Cement is weighed individually on precision-beam scale; aggregates on accumulative dial scale or individual beam scales. Johnson Concentric Batcher sizes: 2 to 8 cu. yds., arranged for 2 to 8 aggregates, 1 to 4 types of cement.

C. S. JOHNSON · Champaign, Ill.
(Koehring Subsidiary)





Equipped with single igging boom, Parsons 310 Trenchliner ex-avates 17 feet deep, 1½ to 4½ feet wide. With dual booms, it digs 6 feet wide, 12 feet eep — speeds installation of largest sewers, ains, transmission systems, footings. Par-ons line of Trenchliners also includes a heel-type Model 150, full crawler-mounted.

Compare Koehring 205 with any other ½-yard

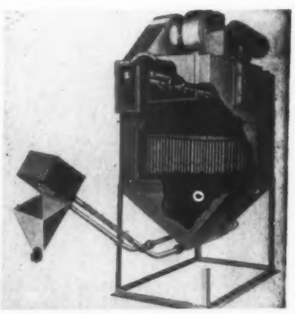
Crowd, swing, boom-hoist and retract clutches on Koehring heavy-duty 205 are among the largest used in the ½-yard class. Powerful cable crowd and electric push-button dipper trip maintain fast dig-and-dump cycles. Automatic traction brakes simplify operation, lock and hold the 205 when working or parked. *Work capacity:* ½-yd. shovel or hoe; ½ to ¾-yd. clamshell or dragline; 10-ton lift crane on crawlers; 15-ton truck crane.

KOEHRING Company
Milwaukee 16, Wis.

V62

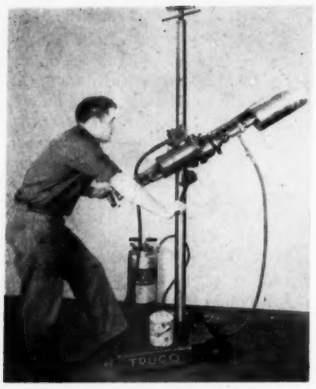
HEAVY-DUTY CHAIN: Featured X-weld prevents kinking, breaking. **American Chain & Cable Co., Inc.**, 929 Connecticut Ave., Bridgeport, Conn. Circle No. 113.

ADJUSTABLE WRENCH: Self-locking. In three sizes: 0 to 1 5/16 inches. **J. H. Williams & Co.**, 400 Vulcan St., Buffalo, N. Y. Circle No. 114.



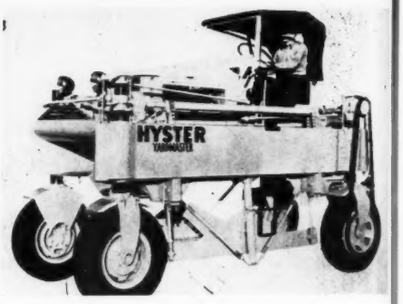
SCRUBBER: Removes dust fumes, exhaust odors. Capacities from 500 cfm to 40,000 cfm in 15 sizes. **Johnson-March Co.**, Philadelphia, Pa. Circle No. 115.

ROCK DRILL: Centrifugally operated hammer; gasoline, electric motor. Drives form pins. **Pitnam Industrial Products Co., Inc.**, 608 Fifth Ave., New York 20, N. Y. Circle No. 116.



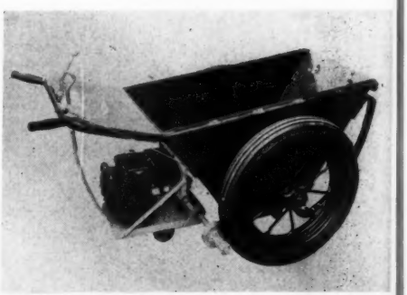
DRILLING UNIT: Portable; drills holes up to 6¼ inches. Telescoping mast. **Wheel Trueing Tool Co.**, 3246 W. Davidson Ave., Detroit, Mich. Circle No. 117.

STRADDLE TRUCK: Versatile Yardmaster now has 20,000-pound capacity. Hercules 91-hp engine; 12-inch clutch, vacuum power brakes; heavy-duty differential. **Hyster Co.**, 2902 N. E. Clackamas St., Portland 8, Oreg. Circle No. 118.

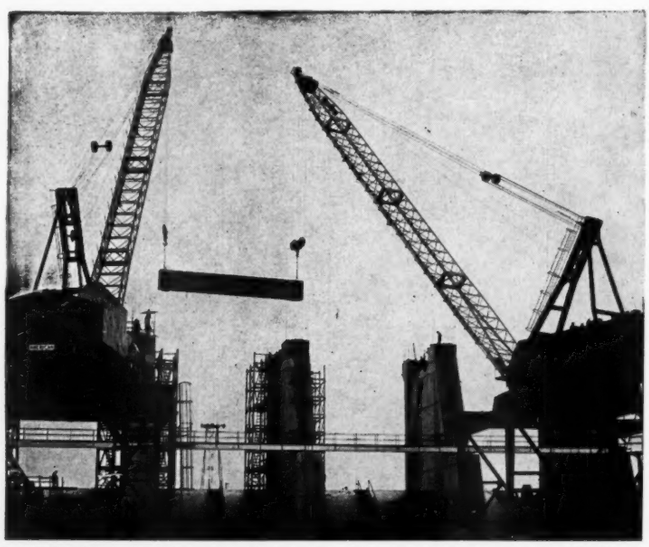


TRENCHER: Now mounts on Ferguson tractor. Digs to 42 inches deep, 12 to 18 inches wide. Digging speeds from 8 inches per minute. **Earth Equipment Corp.**, 2036 Sacramento St., Los Angeles 21, Calif. Circle No. 121.

CONCRETE CART: Motorized unit has 8-cubic-foot heaped capacity. Both wheels driven by 3-hp motor. Good balance prevents tipping. Hand-operated clutch. **Chester L. Eshelman Co.**, 109 Light St., Baltimore 2, Md. Circle No. 120.



DRAFTING DESK: Modulator line includes 14 models with drawing boards in sizes from 26 × 40 to 43½ × 72 inches. Aluminum board adjusts to 12-inch height, any angle. Steel desk; plastic top. **Emeco Corp.**, Hanover, Pa. Circle No. 119.



A 35-TON precast and prestressed girder being lowered into place in the north row of girders for the spillway bridge.

Unique Vibrator Mounting Enables Spillway Contractor to Vibrate Portion of Girder Impossible to Reach Internally

• **Contractor's ingenuity** has been an important factor in precasting and prestressing operations of the 32-span bridge of massive Garrison Dam which cuts off the Missouri River channel at Riverdale, North Dakota. Precasting and prestressing, although only a small part of the $13,300,000 stage 1 spillway contract, presented unexpected problems in placing the concrete.

• **The huge concrete slab** of the spillway chute was used as a casting bed for precasting and prestressing by the contractors on the project, Johnson, Drake & Piper, Inc.; C. F. Lytle Company; Foley Brothers, Inc.; Winston Brothers Company, and Donovan Construction Company. Among the many members cast on the job, were 64 girders, 47.33 feet long and 6 feet high. Viber Model PX high speed pneumatic external vibrators were used underneath on the first ten to twelve inches of concrete. It was impossible to reach this concrete with internal vibration due to the seven cables that fill the seven inch web.

• **A novel rig** for mounting external vibrators was so portable that the contractor was able to place this concrete with two VIBER Model PX external vibrators. As concrete was placed, the jack and vibrators were rolled under the girder form between timber supports. Raising the jack forced the vibrator to bear against the form, vibrating the mix. Through use of this rig, the vibrator could be quickly shifted to another position against the form or rolled to the next pour.

• **For further information** on Viber's complete line of internal and external vibrators, contact your authorized distributor or Viber Company, Dept. 77, 726 South Flower Street, Burbank, California.

A WORKMAN opens the valve to start a VIBER pneumatic vibrator held against the lower flange of a girder form by a Blackhawk floor jack. This external rig can be quickly moved to another location.

VIBER

CONCRETE VIBRATORS SINCE 1931

FOR LOW-COST, ACCURATE MEASURING

EMPLOY A

ROLATAPE

MEASURING WHEEL!

MODEL "400" This Model is a favorite and is widely used by Telephone Companies and other Utilities, paving contractors, land appraisers, etc. It's four-foot circumference measuring wheel makes it most suitable for measuring fairly rough terrain. Automatic measuring counter can be reset at any distance. Folds compactly.

MODEL "200" A popular Model for interior and exterior use. Tabulates wall-to-wall, vertical, or a 101 other measuring assignments. Folds compactly for kit or glove compartment.

MODEL "600" For cross country acreage measurement and work on rougher terrain.

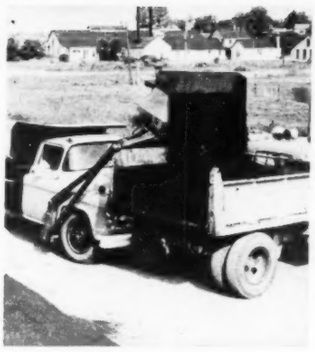
NOTE—All Rolatape Models are designed to tabulate accurate measurements, and are constructed for long and dependable service. With Rolatape, you measure as you walk.

FOR COMPLETE ROLATAPE INFORMATION AND PRICES PLEASE WRITE

ROLATAPE, INC.
1741 14th Street, Santa Monica, Calif.
OR SEE YOUR LOCAL DEALER

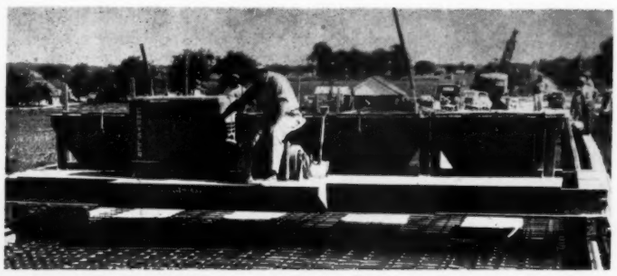
For more facts, use Reader-Reply Card opposite page 18 and circle No. 243

For more facts, use Reader-Reply Card opposite page 18 and circle No. 244



TRUCK LOADER: Hydraulically operated unit has 3,000-pound capacity; fits most trucks of from 1½ to 4-ton size. Special models for trucks over 4-ton capacity. Truck it mounts can load itself; forward tilting bucket allows loading of other trucks. Loads sand, gravel, and other materials at speeds up to 2 yards per minute. **LoDal, Inc.**, Mars, Pa. Circle No. 122.

SIDE-DUMP TRAILER: Built to team with Caterpillar DW20 tractor, the PD20 trailer hauls and dumps 22 cubic yards heaped (30 tons). Speeds from 2.9 to 34.1 mph. Hydraulic telescopic hoists tilt body 70 degrees to empty load. Can be fitted for right or left-side dumping in the field. **Athey Products Corp.**, 5631 W. 65th St., Chicago 38, Ill. Circle No. 123.



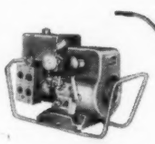
CONCRETING MACHINE: New concrete conveyor car carries 5 to 6 cubic yards in four separate hoppers, paves bridge deck four times as fast as hand carts. Eight-foot-wide frame; runs on same track as standard finishing machine. Adjustable width and length. Handles to 80 cubic yards per hour. **Penn Iron Works, Inc.**, Reading, Pa. Circle No. 124.

COMPRESSOR: Portable rotary unit, the Blue Brute 600, is completely new in design, engineering. New, greater capacity of 600 cfm. Easy-acting clutch permits warming up engine before cutting in compressor. Results: less wear, quicker starts in cold weather, simplified engine maintenance. Fully self-draining compressor eliminates settling of oil and moisture in any low areas of cylinders, interstage chamber, discharge point. Unique cylinder arrangement gravity-drains all oil and moisture during shutdowns, affording protection of blades on cold starts. Additional features include two-stage oil separator, separate oil reservoir and air tanks, and shorter wheelbase for easier handling. Simplified design permits unskilled mechanics to replace rotor blade in a few minutes in the field. **Worthington Corp.**, Worthington and Harrison Ave., Harrison, N. J. Circle No. 125.

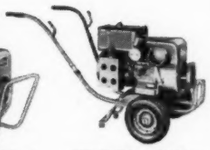
More Power, Lighter Weight, More Compact

Powered by dependable 4-cycle engines

Model 205AJ
2,500 watts A.C.



CARRYING FRAME for hand lifting and moving.



TWO-WHEEL DOLLY for easy moving by one man.

Put more power on the job!

These new power-packed electric plants are smaller . . . lighter . . . easier to take along and move around. Model 205AJ shown here weighs only 154 pounds . . . *yet it develops 2,500 watts A.C.*

Multiple receptacles allow direct plug-in of several floodlights or heavy-duty electric tools, supplying a whole crew with labor-saving electric power.

These new plants are completely Onan-built with Onan engines direct-connected to Onan generators for trouble-free long life. Carrying frames and two-wheel dollies are optional equipment.

Onan Portable Electric Plants: 500 to 5,000 watts.

Write for Folder

Onan ELECTRIC PLANTS

D. W. ONAN & SONS INC.

2856 University Avenue S. E., Minneapolis 14, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 245

IMPORTANT LITERATURE

Please Select and Write

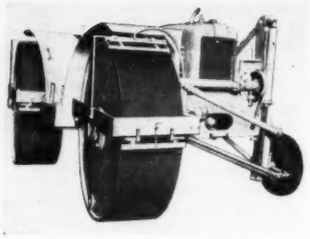
FARRELL-CHEEK STEEL COMPANY

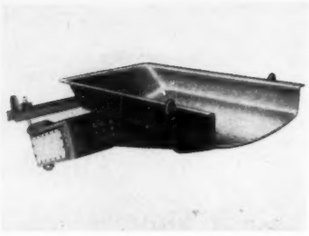
SANDUSKY, OHIO

Finest Name in Cast Steel!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 246

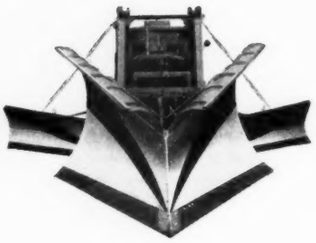
TRENCH ROLLER: Model DTR-552 has two 60-inch-diameter, 20-inch-wide heavy compression rolls adjustable to provide compaction widths of from 20 to 39 inches. Compaction per linear inch of roll: 345 pounds per roll with water ballast. Two speeds forward and reverse. **Blaw-Knox Co.**, Construction Equipment Division, Farmers Bank Bldg., Pittsburgh, Pa. Circle No. 138.

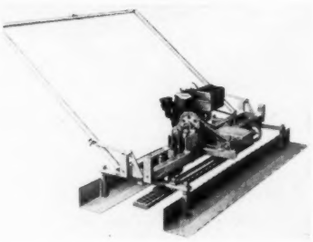




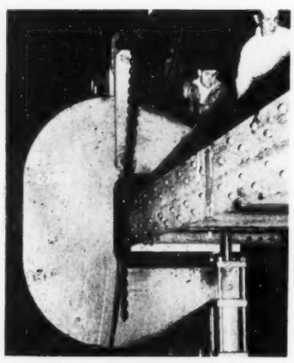
VIBRATORY FEEDER: Optional dust-tight design feature on this equipment protects against dusty atmosphere and supply hopper spillage. Equipped with 48 x 60-inch flat pan trough, the F-55DT Vibra Flow feeder reportedly has a maximum capacity of 500 tons per hour. Separate controller box furnished for wall mounting. **Syntron Co.**, Homer City, Pa. Circle No. 140.

SNOWPLOW: Operates as V plow, as one-way right-hand discharge unit, or as one-way left-hand discharge plow. Cutting widths range up to 23 feet 6 inches. Hydraulic control of moldboards even while plow is moving. Plow also reversible. Recommended for maintenance operations on airports and all modern highways. **Wausau Iron Works**, Wausau, Wis. Circle No. 139.



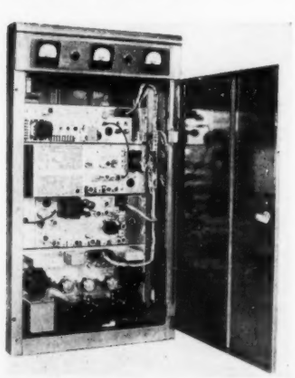


SIDEWALK FINISHER: Powered by 2.5-hp engine, this sidewalk tamping-screeding machine may be equipped with screeds and tampers for 4, 5, or 6-foot sidewalk widths. Screed strokes per minute, 90; tamper strokes, 225. Adjustable for depth of tamper strokes. **Whiteman Mfg. Co.**, 3249 Casitas Ave., Los Angeles 39, Calif. Circle No. 475.



HYDRAULIC RIVETER: Mobile unit with 70 tons thrust for setting 1-inch hot rivets in reinforcing members on bridge I-beams. **Manco Mfg. Co.**, Bradley, Ill. Circle No. 480.

REPAIR LINK: Twin-Pin connecting link repairs chain in 5 minutes. Only hammer needed. **Page Engineering Co.**, Clearing Post Office, Chicago 38, Ill. Circle No. 481.



BASE STATION: Mobile radio base unit. Four channels. **Allen B. Du Mont Laboratories, Inc.**, 750 Bloomfield Ave., Clifton, N. J. Circle No. 482.

Announcing New Complete S-A

S-A Modern Stā-Bilt Method of Road Stabilization

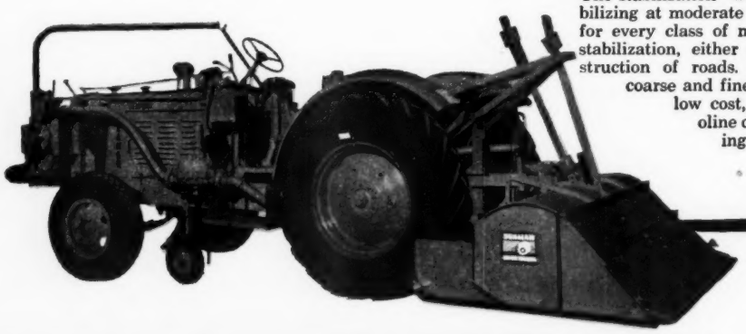
SEAMAN TRAV-L-PLANT and PULVI-MIXER build better road bases through faster, more thorough, accurately controlled in-place mixing — a normal production rate of up to A MILE A DAY of 22-foot road! Exclusive advantages include: Mixing for *all* types of stabilization including bituminous, soil-cement, gravel, or chloride, both sodium and calcium. Blending and properly placing aggregates and fines for more durable, higher loadbearing bases. Completely correcting aggregate segregation. Mixing, blending and finishing to final grade, partially pre-compacted ready for final rolling.

S-A SEAMAN SELF-PROPELLED TRAV-L-PLANT

Designed for highly accurate application of all binder including water and bitumen, simultaneously with mixi operations. Equipped with pump, spray bar, tachomet assemblies, volumetric meter. All operating controls wit in quick easy reach. A perfect, *all-process* machine f economical mix-in-place operations. 7-foot mixing widt gasoline or Diesel powered.

S-A SEAMAN SELF-PROPELLED PULVI-MIXER

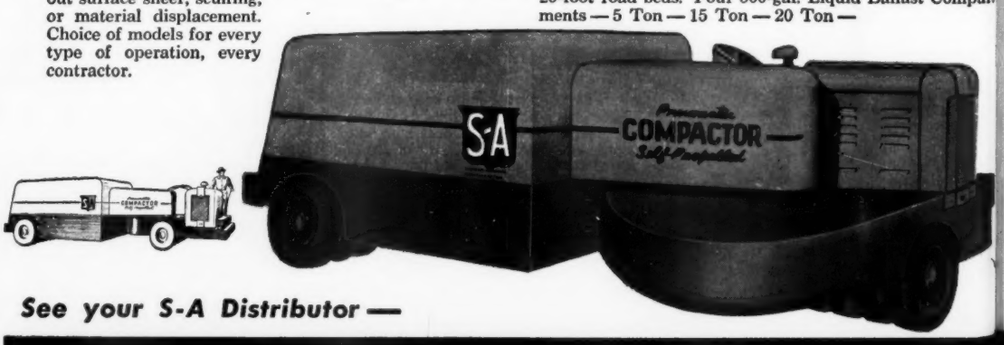
The stabilization "workhorse" for all types of st bilizing at moderate investment. Widely accepte for every class of mixing and processing of s stabilization, either new construction or re-co struction of roads. Delivers accurate blend coarse and fine aggregate — for all-weathe low cost, long-wearing surfaces. Ga oline or Diesel powered. 7-foot mi ing width.



S-A COMPACTOR SELF-PROPELLED, PNEUMATIC

Revolutionary new design in heavy duty rubber tire roll ers. Self-propelled for transport road speeds up to 2 m.p.h. Provides new "straight down" pressures . . . elim inates usual pushing action, surface shear, scuffing, ma terial displacement. Power steering — full 180° turn o 20-foot road beds. Four 500-gal. Liquid Ballast Compart ments — 5 Ton — 15 Ton — 20 Ton —

New SEAMAN-ANDWALL Portable and Self-Propelled Rollers and Compactors offer many new advantages in road building . . . Greater visibility and maneuverability, easier transport to the job, plus many new features that assure superior compaction, more accurate rolling — without surface sheer, scuffing, or material displacement. Choice of models for every type of operation, every contractor.



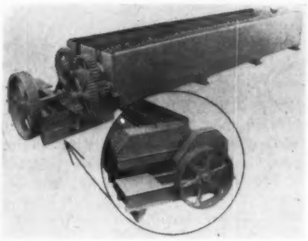
See your S-A Distributor —

Open the way to **BETTER ROADS...at lower cost**

SELF-PROPELLED LOADER: Improved TraveLoader loads 10 cubic yards loose material per minute, 20 cubic yards of snow. Two conveyor lengths. Working speeds as low as .29 mph; travel speeds to 26.7 mph. Loads trucks from stockpiles or windrows. **Adams Division, Le-Tourneau-Westinghouse Co.**, Peoria, Ill. Circle No. 476.

SHOVEL-CRANE: Bantam Model CR-35 self-propelled unit features 19½-foot turning radius. Operates as ⅜-cubic-yard shovel, 6-ton crane. Two-speed independent travel. Swing speed of 6.65 rpm; line speed of 176.5 fpm. Attachments include dragline, trench hoe, grapple, pile-driver, backfiller, clamshell, etc. **Schield Bantam Co.**, Park St., Waverly, Iowa. Circle No. 478.

SUSPENDED SCAFFOLD: Recommended for use on bridges, highway structures, etc. Lightweight, easily assembled and erected, readily moved on the job. Scissors and interchangeable hangers, used in sets of four, support up to 2,000 pounds. Adjusts to I-beam width, height; swings, turns, raises, lowers. **Swing-Lo Suspended Scaffold Co.**, Covert, Mich. Circle No. 477.

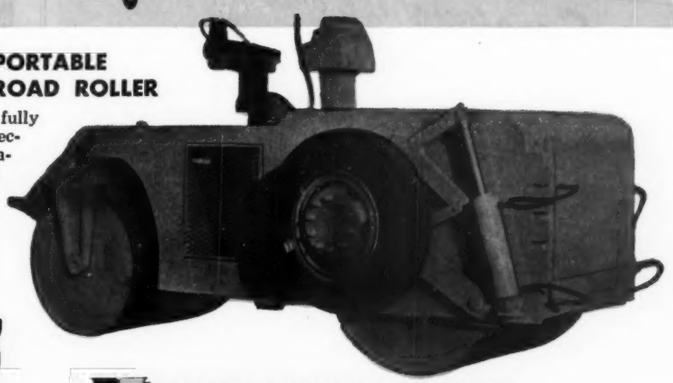


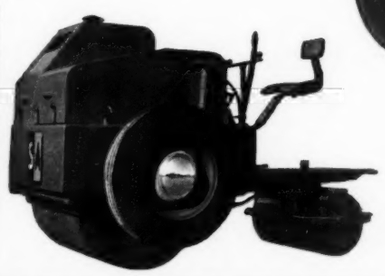
GRAVEL WASHER: The Mudmaster is available in 25 and 30 foot lengths; power requirements for these units are 50 and 60 horsepower, respectively. Fabricated steel box, open-spur gearing with protective guards, antifriction bearings, heat-treated paddles. For washing material from sand, gravel, crushed stone. **McLanhan & Stone Corp.**, Hollidaysburg, Pa. Circle No. 479.

S-A Stā-Bilt Line for Road Construction

SEAMAN-ANDWALL PORTABLE 7-10 TON TANDEM ROAD ROLLER

The first portable 10-ton Roller that is fully automatic, can be made portable in 90 seconds, and provides easy one-man operation. Equipped with 61 H.P. engine, fuel-saving TURBO-TORQUE drive. Hydraulically lowered trailing wheels are hinged and removable for rolling close to vertical obstruction.





SEAMAN-ANDWALL PORTABLE TANDEM 2-3 TON ROLLER

Highly maneuverable, compact, versatile, "one-man" Roller, designed for a wide variety of jobs. Gasoline powered, with compaction roll designed for liquid ballast. Hydraulically lowered pneumatic tired wheels for easy trailing and transport. Wheels removable for close-up rolling to avoid hand work.

SEAMAN-ANDWALL SPREADERS
For Superior Efficiency in Spreading All Materials ... Cement, Sand, Salt, Cinders, Gravel

There's a SEAMAN-ANDWALL Spreader for every need, in models and sizes to fit every road-building budget. Each one has unique advantages and features to meet specific requirements — in all types of materials, in daily production, and in accuracy of volume and placement.

HERCULES CEMENT SPREADER

Heavy duty spreader for soil-cement paving. Auto-type differential provides efficient transfer of power, hand-lever controlled. Has strike-off bars for accurate quantity control up to 10-foot width. Dual Pneumatic tires for traction. Easy to attach, requires no special tail gate.

CENTURY CEMENT SPREADER

A new idea in spreader design, providing absolute accuracy in cement spreading. Positive volumetric control of cement governed by free-running tachometer wheel which cannot skid or slow down. One-man remote operation from truck cab.

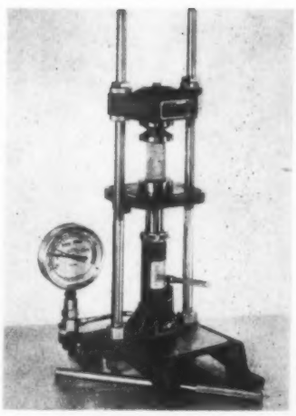
CENTURY MATERIALS SPREADER

The SA Century "Posi-Feed" Model HY-4 . . . Demountable tray for seal coating can be replaced with spinner for spreading sand or chlorides. Vibratory mechanism in the truck body maintains steady movement of materials to avoid uneven distribution. Eliminates hand feeding from truck body. One man operation.

Write for Bulletin

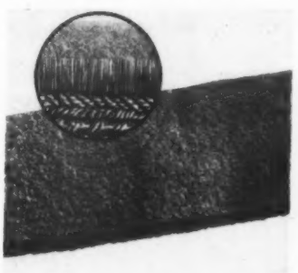
TODAY'S HIGHEST STANDARD OF EFFICIENCY AND ECONOMY IN MODERN ROAD BUILDING . . .

S-A SEAMAN-ANDWALL CORPORATION
282 North 25th Street, Milwaukee 1, Wis.



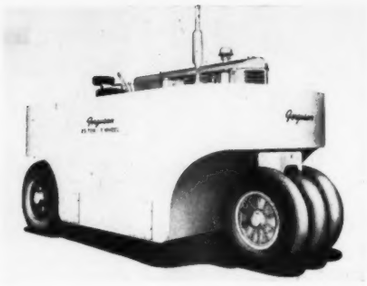
LABORATORY PRESS: For compression, tests of soils, construction materials. Loads to 20,000 pounds. **Fred S. Caver, Inc.**, One Chatham Road, Summit, N. J. Circle No. 483.

MEASURING WHEEL: One-man operated. Measurements automatically recorded. Economical; labor saving. **Rolatape, Inc.**, 1741 14th St., Santa Monica, Calif. Circle No. 484.



ROLL WASH MAT: Wash for road rollers. Distributes water over entire roll surface. Cocoa fiber. **Koffler Sales Corp.**, 3757 N. Racine Ave., Chicago 13, Ill. Circle No. 485.

PORTABLE CRUSHING PLANT: Delivers pit-run material for direct haul to nearby highway construction sites. Reportedly one of the largest portable units made, it can safely be transported over highways. Easily maneuvered around gravel-pit site. Output on job for one contractor: 100 to 125 tons per hour. Central unit is Eagle 18 x 36-inch jaw crusher. Powered by 60-hp electric motor energized from a nearby motor generator or supply line. **Eagle Crusher Co., Inc.**, 124 N. Washington St., Galion, Ohio. Circle No. 131.



RUBBER-TIRE ROLLER: The Ferguson Model 257, a self-propelled compactor with seven pneumatic-tire wheels, is capable of 25 tons' pressure when fully ballasted. Minneapolis-Moline 62-hp gasoline or diesel engine; special transmission with six forward, six reverse speeds. Large-diameter tires for high rolling speeds. **Shovel Supply Co.**, P. O. Box 1369, Dallas, Texas. Circle No. 132.

POWERED WHEELBARROW: Hauls ¾ ton on a chassis 64 inches long, 31½ inches wide. Dump bucket hauls 10 cubic feet measured level, up to 16 cubic feet heaped. Easily changes over to flat-bed rig for solid building materials. Forward and reverse transmission; recoil starter. Sealed-in lubrication, one-piece engine hood simplify maintenance. **Prime-Mover Co.**, Sampson St., Muscatine, Iowa. Circle No. 133.

MAKE US PROVE IT!

We WANT you to make us prove that statement! Let any one of our dealers demonstrate a SCOOPMOBILE on the job against any other loader of comparable capacity.

A FEW OF THE MANY OUTSTANDING FEATURES OF THE LD SERIES SCOOPMOBILE:

- ✓ 4-Wheel Drive
- ✓ 4-Wheel Powered Steering
- ✓ 4-Wheel Powered Brakes

Notice how the required weight and strength are built into this LD model SCOOPMOBILE *without* bulky counterweight.

COMPLETE RANGE of capacities and models: Model H (3-wheel chassis) capacities ¾ through 3 cubic yards. LD SERIES (4-Wheel Drive) capacities 1 cubic yard through 4 cubic yards.

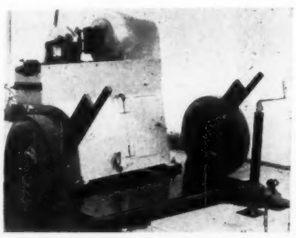
MIXERMOBILE MANUFACTURERS
8027 N. E. KILLINGSWORTH • PORTLAND 20, OREGON

4-WHEEL DRIVE SCOOPMOBILES • 3-WHEEL SCOOPMOBILES
DUO-WAY LIFTS AND SCOOPS • MIXERMOBILES • TOWERMOBILES

We would like to see your SCOOPMOBILE demonstrated. Please advise name of nearest dealer and have him get in touch with us.
Approximate bucket capacity, _____ cu. yds.

Name_____ Title_____
Firm_____
Address_____
City_____ Zone____ State_____

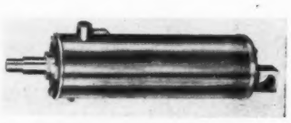
For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 248



PIPE-THREADING MACHINE: Thred-O-Matic 44 Pipe Shop. Double power-operated automatic chuck. **Gaines-Collins,** 5474 Alhambra Ave., Los Angeles 32, Calif. Circle No. 134.

EARTH BORER: Super Hole-A-Matic is operated easily by one man. **High** durability, good performance. **Gen-A-Matic Corp.,** 14741 Bessemer St., Van Nuys, Calif. Circle No. 135.

POWER TROWEL: Three trowels; central shaft driven by gas engine. **Thor Power Tool Co.,** Construction Equipment Div., 175 N. State St., Aurora, Ill. Circle No. 136.



HYDRAULIC CYLINDER: Four (5, 6, 7, 8-inch) bore sizes; to 36 tons at 1,000 to 1,500 psi. **Wisconsin Hydraulics, Inc.,** 3165 N. 30th St., Milwaukee 16, Wis. Circle No. 137.

Construction materials

New developments in concrete-forming, building, paving, maintenance products point the way to improved construction techniques.

FIBREBOARD FORMS: Shipped flat, these new corrugated forms are easily cut to any size and installed. Lightweight, they nevertheless support workmen, machines, reinforcing steel, concrete. Have supported loads up to 910 pounds per square foot with diagonal fiberboard bracing. Special void-box forms leave unstable soil free to move beneath concrete without disturbing slab. **Concrete Forms, Inc.**, Box 13702, Dallas 24, Texas. Circle No. 486.

PAVEMENT BLOCKS: Vitrified ceramic blocks with high compressive strength, great density, low volume change under wide temperature ranges. Blocks measuring 8×8×4 inches are placed on sand bed, reinforcing bars placed in between them, and cement mortar poured into joints. Blocks are immune to moisture penetration, having no cells or voids. Low cost; inexpensive maintenance. **Poston Brick & Concrete Products Co.**, Springfield, Ill. Circle No. 494.

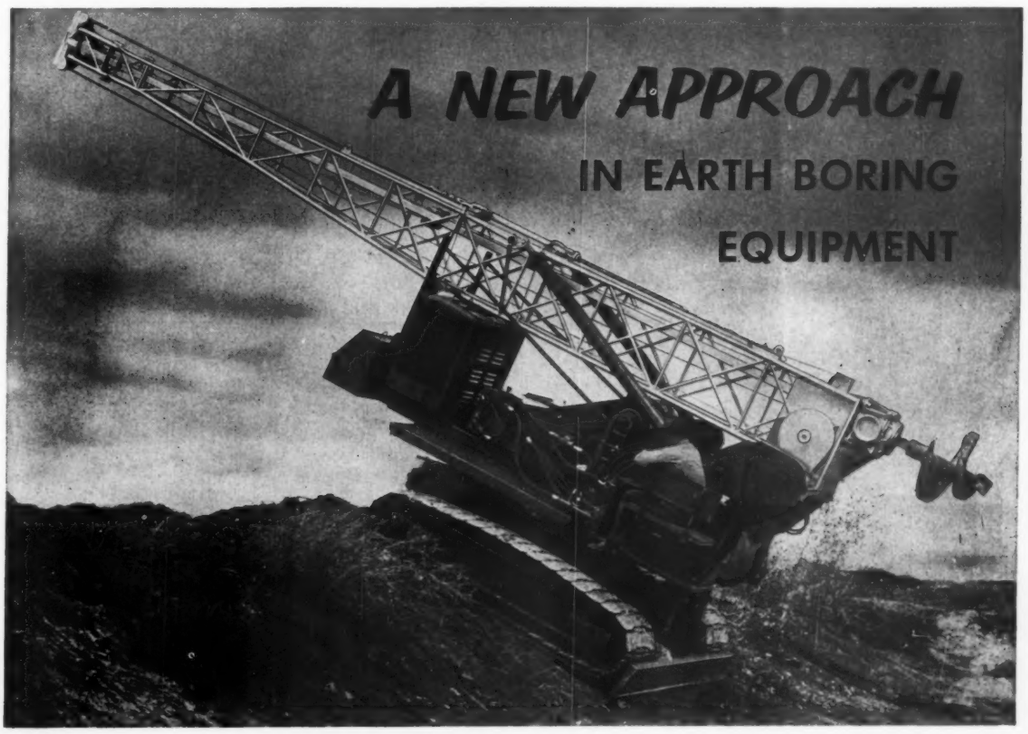
SLAB INSULATION: Perimusul provides perimeter insulation for concrete slabs, serves as expansion joint between slab and foundation. High thermal efficiency; moisture resistant. Baldwin-Hill Co., Breunig Ave., Trenton 2, N. J. Circle No. 499.

PLYWOOD ROOF FRAMING: PSI trusses use long-length plywood in combination with steel. Delivered to site with all lumber and plywood precision-cut to detail, steel and hardware fabricated to pattern. Carpenters, mobile cranes assemble, erect trusses. Standard 32, 40, 50, 60, 80-foot spans available; longer spans on special order. Practical, economical, permanent. **Plywood Structures, Inc.**, 323 Pittock Block, Portland 5, Oreg. Circle No. 492.

HARD-SURFACING ELECTRODE: Another iron-powder electrode, the Hard-alloy 48, combines speed of contact-type electrodes with weld metal soundness, crack resistance of low-hydrogen weld deposits. Deposits weld metal as much as 50 per cent faster than conventional hard-surfacing electrodes. Sizes: ⅛, 5/32, 3/16 inch. Designed for downhand welding; may also be used vertically. **The McKay Co.**, 493 McKay Bldg., Pittsburgh 22, Pa. Circle No. 490.

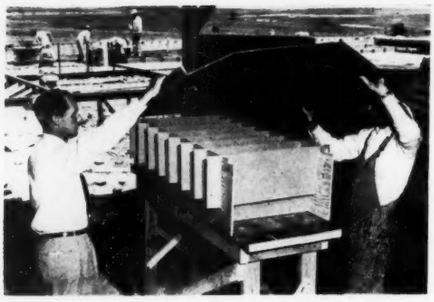
(Continued on next page)

STEEL BUILDING: This 748-foot-long warehouse is made of Steelox steel paneling. Steelox is also available in prefabricated buildings for use as maintenance shops, field offices, equipment and tool sheds, etc. **Armco Drainage & Metal Products, Inc.**, Middletown, Ohio. Circle No. 496.



It's New! It's Revolutionary! It's Rugged!
The new crawler-turntable mounted WILLIAMS MDHC Hole Digger is the answer to many problems of the foundation contractor.
Travel of the unit into digging position and all other operations are controlled by the digger operator. The turntable-slide mechanism permits rapid spotting of the auger and the drilling of holes anywhere within a 270-degree arc around the machine and extending or retracting of the drilling unit over a distance of two feet at any point within this swing. These features, plus the well known performance of the MDH Digger, all add up to a real money-maker.
HUGH
WILLIAMS
HUGH B. WILLIAMS MANUFACTURING CO.
8330 LOVETT AVE. • BOX 7815 • DALLAS, TEXAS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 249



FIBERBOARD FORMS: Used in place of metal pans for concrete-floor construction. Withstand top-to-bottom compression of approximately 1,000 pounds per square foot—giving ample strength to support men, machines, concrete. **Hoerner Boxes, Inc.**, 1900 Windsor Place, Fort Worth, Texas. Circle No. 498.

(Continued from preceding page)

PAPER BOX FORMS: For greater economy in Lift-Slab construction, other types of concrete work. Corrugated paper box forms, coated with wax for waterproofing, are joined by masking tape. Used to create waffle pattern; easily removed after slab is poured. Support crews and machines. Sizes made to order. Partition structure inside gives added strength. **Container Corporation of America**, 2001 E. 57th St., Los Angeles 58, Calif. Circle No. 487.

ELASTIC SEALER: Presstite No. 162 elastic tape provides waterproof seal around glass panels in modern glass-and-metal-wall buildings. Glass is firmly sealed in a bed of elastic compound which does not harden, chip, or slump. Retains weatherproof characteristics. **Presstite Engineering Co.**, 3798 Chouteau Ave., St. Louis 10, Mo. Circle No. 491.

BONDING COMPOUND: Clynch-T permanently bonds plaster, concrete to themselves or to most other sound surfaces. Applied with brush or spray; dries from 30 minutes to 2 hours depending on surface, weather. Contains no harmful solvents; is not affected by acids or alkalies in lime, plaster, cement. May be used on green concrete. Gallon can covers 400 to 500 square feet. **Dasco Chemical Co., Inc.**, 1602 Thames St., Baltimore 31, Md. Circle No. 493.

PAVING PRESERVATIVE: Silicone-base compound keeps new concrete surface free of cracks, cuts down slipperiness on highways. Said to double road life. **L. Sonneborn Sons, Inc.**, 404 Fourth Ave., New York 16, N. Y. Circle No. 497.

RUBBER CROSSING: Rubber slabs with 7-gage steel supporting members imbedded in the rubber are bolted to roadbed ties, providing maintenance-free, skid-resistant crossing where highways intersect with railroad tracks. Fitting snugly around the rails, the rubber slabs make a water-tight seal with the tracks. Heavy treads; shock-absorbing. **Goodyear Tire & Rubber Co.**, Akron 16, Ohio. Circle No. 488.

IRON-POWDER ELECTRODE: Jet-Hard BU-90 for fast build-up of worn parts at low cost. Produces a medium-carbon medium-alloy deposit which becomes a dense, moderately hard, machinable surface to resist shock and abrasion. Smooth arc, minimum spatter. Available in 5/32, 3/16, and ¼-inch sizes; for use in building up shafts, wheels, grousers, rolls and idlers, sprockets, gears, etc. **The Lincoln Electric Co.**, 22801 St. Clair Ave., Cleveland 17, Ohio. Circle No. 489.

INSULATING CONCRETE: Perlite concrete lends itself to almost any kind of roof-shape development, at the same time insulating the roof deck. Mixed on the site, placed over wire mesh. Very high strength. **Perlite Institute**, 45 W. 45th St., New York, N. Y. Circle No. 462.

ALUMINUM HIGHWAY SIGNS: Aluminum "boards" up to 30 feet long may be used to construct signs for superhighways. Signs up to 30 feet high and of unlimited width, or to 30 feet wide and of unlimited height, may be assembled from these sheets. Panels resist deterioration caused by rust, rot, mildew, insects, inclement weather, etc. Aluminum panels need no protective coating, are easily maintained. **Reynolds Metal Co.**, 2500 S. Third St., Louisville, Ky. Circle No. 461.

ALLIS-CHALMERS CONSTRUCTION MACHINERY

SOLD but not forgotten

by your Allis-Chalmers dealer

When you invest in Allis-Chalmers construction equipment, you are getting far more than just a modern machine. Your dealer offers you the opportunity to do a better job at lower cost. He wants your equipment to give A-1 performance day in and day out. His reputation depends on it.

That's why your Allis-Chalmers dealer puts so much importance on good preventive maintenance practices . . . encourages you to take full advantage of his modern servicing facilities.

You're always sure of

TRUE ORIGINAL PARTS

from your Allis-Chalmers dealer

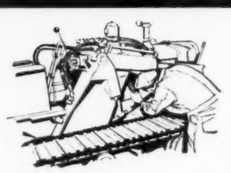
Parts made in the same factory, to the same rigid specifications as original equipment, are your assurance of getting top performance and long life. Treated, packaged and sealed against rust and dust, True Original Parts are stocked in quantity by each dealer to give you quick service close to your job.

And you can have confidence in his

FACTORY-TRAINED MECHANICS, FACTORY-APPROVED METHODS

IN THE SHOP

Specialized facilities include factory-approved tools and all necessary equipment for complete service. Factory-approved methods are used to save you time and money, assure finest workmanship.



IN THE FIELD

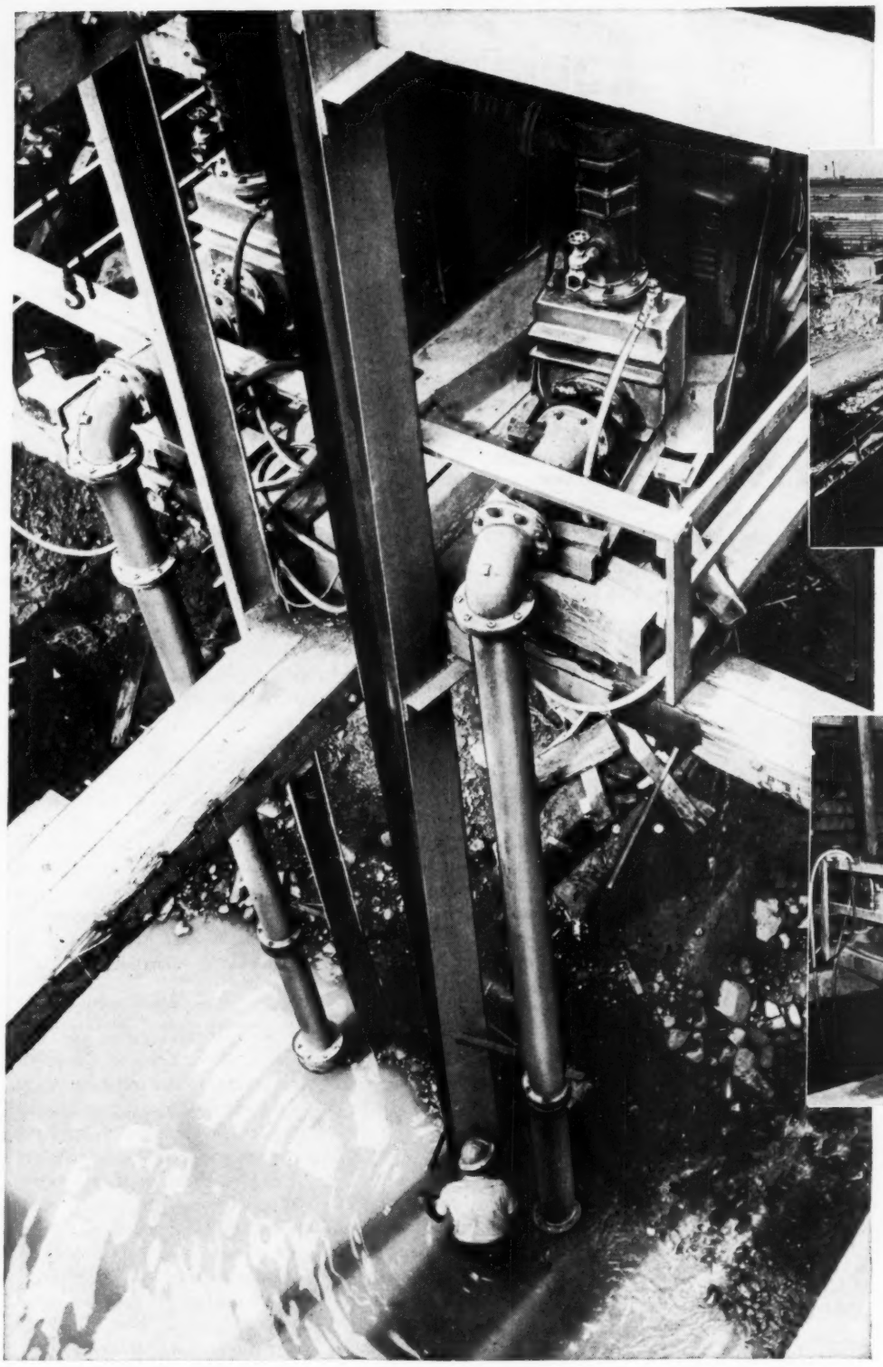
Factory-trained servicemen are ready to help you, day or night. Their technical know-how and practical experience get the job finished fast . . . at lowest possible cost to you.

You can depend on your Allis-Chalmers dealer

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

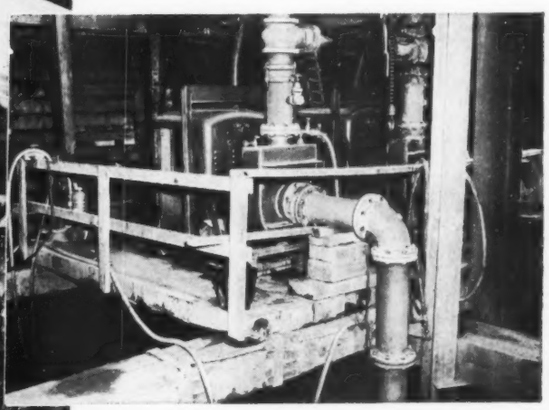
ALLIS-CHALMERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 250



Deep well is 65 feet below grade and only 100 feet from water front.

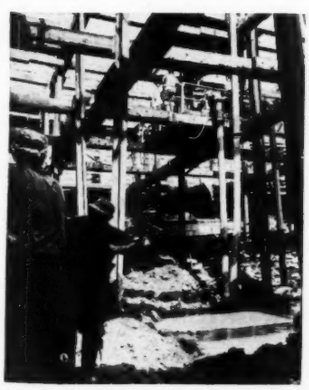
A general view of excavation for new pumping building at Bowery Bay Sewage Disposal Plant, in New York's Astoria area. The suction lift is 24 feet and the discharge is through 250 feet of pipe.



A Tachometer placed on these engines showed 1400 RPM, well below the 1800 RPM maximum recommended by the manufacturer. The pumps are Model 8F3 Marlows with an AGC rating of 125,000 gallons per hour.

Contractor Handles Seepage 65 Feet Below Grade

PUMPS WORK STEADILY LESS THAN 100 FEET FROM RIVER



With pumps mounted on a platform above the working level, the area is kept free for movement of men and material.

PUMPING IS AN important part of the deep coffer dam work proceeding at the Bowery Bay Sewage Treatment Plant in New York City. At a new pumping building, it was necessary for the contractor, J. Rich Steers, Inc., to excavate 65 feet below grade, in a permeable formation less than 100 feet from Bowery Bay.

A constant stream of seepage is controlled by two Marlow 8-inch pumps operating as a team, each running 12 hours on and 12 off. Throttling valves on the discharge lines regulate the flow so that the pumps operate steadily, rather than pumping and priming alternately.

Suction lift on the pumps is 24 feet, but will be reduced to 12 feet as soon as steel is placed and a platform can be built. The present position allows complete freedom for men to work without interference from the pumping equipment.

Pumping started in November 1954 and will continue through 1956. On this $13,000,000 job, there are 11 Marlow pumps, both self-primers and Mud-Hogs. Because of permeable earth, depth of excavation, and water front location, it is essential that the pumps operate dependably.

Need dependable dewatering pumps that will keep your job on schedule — then call your Marlow dealer. Look for his name in your classified phone book, or write for complete information on Marlow pumps . . . and the name of your Marlow dealer.

Marlow PUMPS

S-229A

MARLOW PUMPS

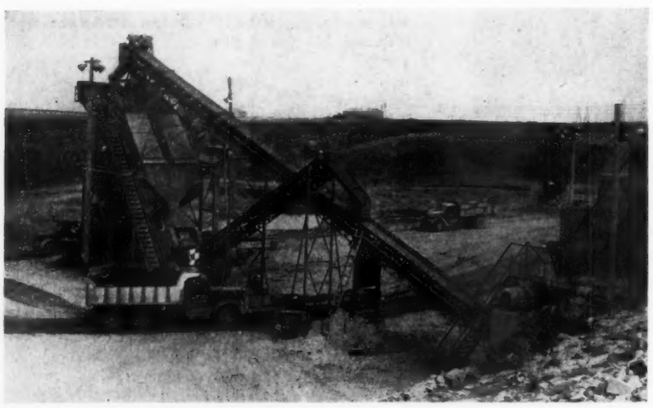
Division of Bell & Gossett Company

RIDGEWOOD, NEW JERSEY

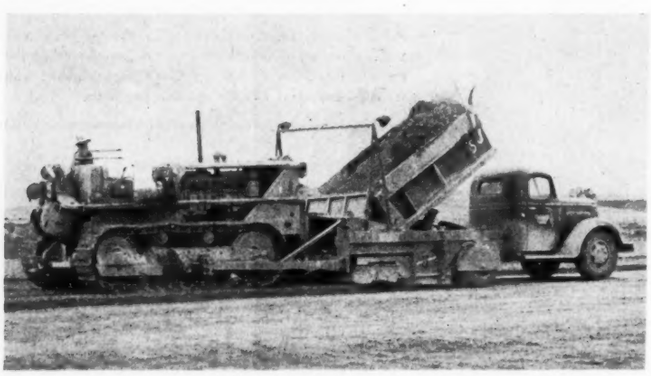
Morton Grove, Illinois Longview, Texas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 251

A Link-Belt Speeder shovel loads a Koehring Dumptor with sandstone rock for hauling to the reduction plant. The shovel works against a 20-foot bank which has been drilled and blasted.



Haul trucks load quickly at the Universal rock-crushing setup about 1½ miles from the project. The primary unit of the electrically driven plant is at the right, and the washing and screening tower, where excess fines are wasted, at left.



A Jersey spreader, mounted on a Caterpillar tractor, lays subbase rock of 1½-inch-minus material. The truck, dumping gradually to the hopper, is pushed along by the spreader.

Equipment speeds pavi

Compactors achieve densities between 90 and 100 per cent on base courses for Malmstrom AFB improvement project

Placement of a subgrade soil and a granular base strong enough to support heavy aircraft loads was done rapidly by modern equipment used by the joint-venture contractor on an improvement project at Malmstrom Air Force Base, Mont., despite the area's light plastic soils, a short construction season, and the fact that base-course material had to be manufactured and then hauled to the job site.

The $4,800,000 improvement project being handled by Nilson-Smith Construction Co., Great Falls, Mont., and Northwestern Engineering Co., Inc., Rapid City, N. Dak., and Denver, Colo., includes a 1,100,000-cubic-yard grading job calling for a minimum 90 per cent Modified AASHO on all fill material to within the top 6 inches of the subgrade. This 6 inches, whether in fill or cut sections, had to have at least a 95 per cent density, measured by the same method.

A 20-inch blanket of granular crushed-rock on top of the subgrade also required high compaction. The first 3-inch leveling course and a 14-inch blanket of 1½-inch-minus rock called for 95 per cent compaction. A 3-inch leveling course of 1½-inch-minus rock, which lay over the subbase, required 100 per cent compaction.

Long hauls common

Exceptionally long hauls were the rule on the grading job, which was done by Nilson-Smith. Work included grading 1,000 feet at each end of an existing runway, and dirt work on taxiways, a parking apron, and warmup stand.

To balance the grading, the U. S. Army Corps of Engineers decided to take material from the 1,000-foot extension on one end of the runway and use it to build up both the extension at the other end and the parking apron. As a result, some of the extreme hauls were nearly 2½ miles long, and many were over 1½ miles in length.

Two major equipment spreads were used to move the material, which consisted of a fine, plastic glacial till having an optimum moisture content of about 13 to 14 per cent.

The first spread had a Euclid loader elevate dirt to a large fleet of 10-yard dump trucks. According to project manager A. C. Nesbitt, Euclid bottom-dump hauling units would have been more efficient, but the trucks also worked well, handling about 60 per cent of the yardage involved. The other spread consisted of five new Caterpillar DW21's, assisted in the pits by several Caterpillar D8 push Cats. These pusher tractors were of the new Series E line.

The principal grading trouble occurred in several soft, mucky places, which were so unstable that it was impossible to build a fill to meet specifications. In several cases, 2½ to 3 feet of this objectionable material was excavated and replaced with better soil, so that fills could be compacted to specifications.

Compaction methods

Nilson-Smith's crews met the 90 and 95 per cent density specifications on grading while managing to place a maximum amount of yardage daily. If additional moisture were needed in the borrow pits, it was supplied by sprinkler trucks. By the time dirt had passed through the Euclid loader or the DW21 scraper bowls, a considerable amount of mixing had dispersed the moisture through the mass. Additional moisture, if needed, was added when the lifts were leveled by a Caterpillar motor grader.

One of the worst problems arose when unseasonable rains allowed only 13 shifts to be worked during an entire month. The surface of the borrow pit was scarified to aerate the soil and, with the help of wind and

(Continued on page 52)

This Hyster grid roller, pulled by a rubber-tire Cat, is one of the types of compactors used to get the required 95 to 100 per cent densities on the subbase for the runway extensions, warmup pads, parking apron, and taxiways.

A Buffalo-Springfield Kompactor, here working on the base course, needed only six to eight passes to secure the 100 per cent density specified for the upper 3-inch leveling course.

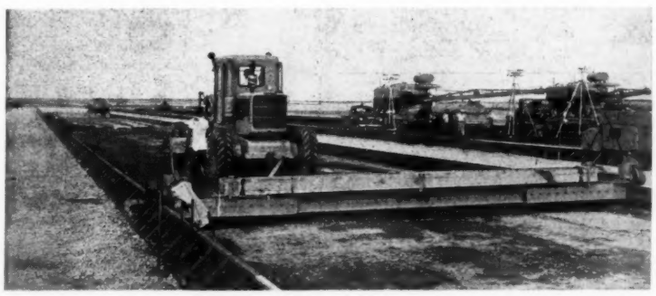
...avit air force base

Heavy forms for 16-inch runway are placed two days in advance; pavers complete 1,200 x 25-foot section in eight-hour shift

After getting off to a slow start because of bad weather extending through the summer months, a new concrete-paving spread, valued at $750,000, has hit its full stride in placing 16-inch concrete as part of an improvement program at Malmstrom Air Force Base, Montana. This work at the Strategic Air Command base is being done by Northwestern Engineering Inc., Rapid City, N. Dak., and Denver, Colo., as part of a $4,800,000 joint-venture U. S. Army Corps of Engineers' contract with Nilson-Smith Construction Co., Great Falls, Mont.

With grading and subbase preparation complete, the remaining big job involves placing about 160,000 cubic yards of portland-cement concrete

Blaw-Knox forms, weighing about 400 pounds and measuring 16 x 16 inches, are anchored with 1-inch form pins driven by a Thor pneumatic gun powered by a Sullivan air compressor.



As the two pavers work down one lane, background, a Caterpillar No. 12 motor grader moves up another, pulling a drag planer for a final finegrading before concrete is placed.

Stiff concrete, with a slump of less than 2 inches, is dumped between the forms by one of the Rex 34-E pavers, the bucket spreading the material as much as possible. Each paver has a dispenser for injecting Protex air-entraining agent into each dry batch.

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for two 1,000-foot extensions to the main runway, and for warmup pads and a parking apron. The taxiway paving will be of asphaltic concrete. Some concrete resurfacing of existing facilities and construction of a hangar along the north side of the field are also included in the present contract.

The 16-inch unreinforced concrete pavement has been designed to accommodate planes operated by SAC. Concrete is being placed in 25-foot strips, and a U-shaped keyway, formed by fastening a metal blockout to the side of steel forms, extends down the side of the longitudinal strips. At 25-foot intervals are transverse construction joints consisting of a two-stage sawed joint filled with jet-fuel-resistant material.

Heavy forms in use

To continue paving on a sustained basis, the contractors ordered 5,000 linear feet of 16 × 16-inch steel form sections, weighing about 400 pounds each, from Heltzel Steel Form & Iron Co., Warren, Ohio. Steel pins driven through pin wells in each section secure forms to the subbase. The heavy job of handling these forms and driving the pins is being done far ahead of paving operations by a Pitman Hydra Lift and a Thor gun powered by a Sullivan 105-cfm air compressor. With the exception of those on the outside edge of the runway, all forms are equipped with keyway blockouts that fasten to one side of a lane.

Strict specifications on form alignment and stability are so important at Malmstrom that the U. S. Army Corps of Engineers has designated one inspector to handle only that part of the work. The joint-venture firm also controls the construction and finishing of the subbase. There has been very little, if any, difficulty in setting the sections to perfect alignment and pinning them down to give heavy concrete-placing machinery stable footing. As a rule, the form sections are placed for a lane at least two days before the paving crew reaches the spot. With this schedule practically all available form footage on the job is being used simultaneously.

After a line of forms has been set and checked, final dressing of subbase is done by a drag planer that is pulled down the lane one or more times, depending on the amount of excess material remaining between the forms. Subbase material was placed to as close a tolerance as possible, but if excessive amounts of material are found in spots, it is moved out of the way by the same Caterpillar No. 12 motor grader being used to pull the drag planer.

Dual pavers work

Two new Rex 34-E dual-drum pavers are turning out mixed concrete for the job at high speed. Work has been placed on a schedule of 1,500 cubic yards of concrete per

Portable floodlight standards, easily rolled alongside the paving train, are quickly pressed into use when work extends into evening hours.

8-hour shift—an amount the two machines can handle easily if enough dry batches are delivered to their skips. The concrete consists of a 5.0 sack mix with an air-entraining agent that makes it more workable and permits the use of material with a stiffer consistency than is ordinary.

The pavers work on each side of a 25-foot strip, their booms practically interlacing. Each rig has automatic features and safety controls, including an automatic dispenser for injecting the correct amount of Protex air-entraining agent into each batch. Mixing water is obtained from supply hydrants at the base and hauled by truck transports to trailers supplying each paver.

Before concrete is dumped between the forms, the subgrade just ahead of the pavers is dampened by a sprinkler hose drawing water from a pump on one of the pavers. This operation is synchronized with concrete placement so that water will not be wasted and the subbase will not be too wet.

Fresh concrete is dumped directly on the subbase, the paver bucket spreading the mix as much as possible. The big concrete slab, containing slightly more than 1.2 cubic yards of concrete per linear foot, is requiring extensive mechanical work. The first machine in the paving lineup is a Blaw-Knox spreader with auxiliary equipment, including ten rear-mounted Viber electric vibrators powered by an Onan gas-electric generating set.

As the spreader moves ahead, the vibrators do a thorough job of consolidating the concrete, making it a level creamy mass of good consistency

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ALL Yaun products are ALL-WELDED, for more strength, with less dead weight. Typical of Yaun's complete bucket line is the 2½ yard clamshell shown. Weld #1, 3 yards long, is Manganese hard surfacing, to keep the cutting lip smooth and sharp for bite after bite, job after job, year after year. All Yaun buckets, drag or clam, have Manganese steel wherever they hit the load; they dig and dump fast and clean, and have long useful life.

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with the right amount of mortar on the surface. Next in the lineup is a Jaeger-Lakewood finisher with two transverse screeds and a center tamping bar. A Koehring longitudinal float and a Flex-Plane machine that operates a canvas belt in a reciprocating motion give the slab a final rough surfacing. Two hand-labor bridges follow, so that a limited amount of work can be done to finish each lane around the edge of the forms. Low spots are finished by hand also. Burlap is placed and a water cure applied to the concrete for a 72-hour period as soon as the surface has hardened sufficiently. Techkote curing compound is applied after the specified 3-day cure under wet burlap.

Two machines are being used to cut the two-stage transverse construction joints; a Concut portable single-blade saw and a Jointmaster. The latter saw has two power units that operate four blades simultaneously. The initial cut is made 2½ inches deep, and this is followed by a surface widening pass that cuts the concrete 1 inch deep. This forms a step-down crack in which the joint-filler material is placed. Specifications require joint sawing to be completed 36 hours after concrete is laid, and initial sawing is generally done as soon as the concrete is hard enough so that no aggregate particles will ravel out of the surface as the cut is made. Temperature and other weather conditions sometimes cause a slight delay in this work, since they influence the setting of concrete.

Batching setup

Now that runs of 1,200 feet in 8 hours are feasible, the aggregate production and batching setup is working well, maintaining a good rate of production so that paving equipment can keep operating efficiently. Sand, pea gravel, and 1½-inch-minus crushed-gravel aggregate are being produced by the commercial gravel facility operated by Oscar Mortensen, Cascade, about 30 miles from the air base.

This material is shipped in bottom-dump railroad cars to the batch plant site just west of the military reservation. There, an efficient unloading method empties a railroad car in only 6 minutes. A receiving hopper below track level accommodates about 60 cubic yards of material dumped by gravity from the cars. Mounted overhead, and operated by electric power, a Hewitt-Robins vibratory car unloader shakes the last remaining material from each car.

The Kolman unloading trap terminates with an apron-type feeder that discharges to a pair of Kolman elevating conveyor flights. The second conveyor in this system is mounted so that it can be moved quickly to discharge sand, pea gravel, or 1½-inch-minus aggregate into the proper storage pile at the plant. If necessary, a Caterpillar D8 tractor-dozer stacks these materials so that the plant crane, a Northwest Model 6 with a 3-yard clam bucket, is able to charge the three bins of a Johnson manual batching plant.

Also under the railroad track is a bulk cement unloading system that carries Trident bulk cement into two Johnson storage silos. There is a 580-barrel main storage silo and a connecting 280-barrel silo where cement is batched to trucks heading for the air base.

Fifteen new Ford T-800 batch trucks being used on this project have been built up to hold four 37.4-cubic-foot dry batches. After receiving aggregate and sand, the trucks drive under the cement hopper for bulk cement, which is deposited in separate compartments, then drive to discharge points at the paving site.

Assisting project manager A. C. Nesbitt on this job is Robert Phillips, general superintendent of paving for Northwestern. Other contractor personnel includes Jim Jones, grading superintendent; William Radovich, asphalt paving superintendent; and Norman Moe, crushing superintendent. THE END

HRB releases review of research activities

A listing of highway research projects now in progress, classified by subject, has been released by the Highway Research Board. The 184-page report covers 886 different projects, each of which is classified and briefly described. Such topics as aggregates, bituminous mixes, bridges, concrete, joints, soils, etc., are covered.

The Highway Research Review, a summary of activities reported by the Highway Research Correlation Service, is available from the Highway Research Board, 2101 Constitution Ave., Washington, D. C., for $3 per copy.

Asphalt Institute opens new district office

The Asphalt Institute, national research and development organization for the asphalt industry, has opened a new district office in Albuquerque, N. Mex., to serve that state and the western part of Texas. Engineers of the new district will work directly with the road-builders in New Mexico on special problems.

The Albuquerque office is the 23rd to be opened by the Institute, which maintains headquarters on the campus of the University of Maryland, College Park, Md.

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for dependable concrete maintenance and repair

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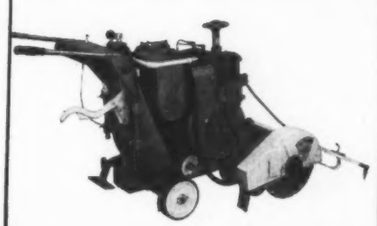
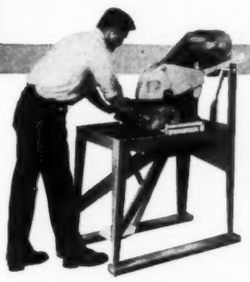
1 **FELKER MODEL 100**—A low priced concrete cutter for patchwork and light cutting. Light, exceptionally maneuverable. 7.5 hp Wisconsin drives 8" through 12" blades. Right or left hand operation with double end spindle.



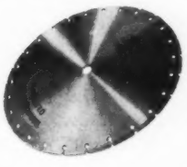
2 **FELKER MODEL 200**—13.5 hp Wisconsin engine drives 10" through 14" blades. Equipped with power drive which removes physical effort, cuts more footage and extends blade life. Includes auxiliary coolant pump assembly.

3 **FELKER MODEL 254**—A heavy duty machine powered by a 25 hp Wisconsin engine. Perfect balance . . . tilts on front or rear wheels for quick maneuverability. Uses 14" diamond wheels or 18" wheels with special guard. Instant acting pump clutch saves wear, automatically shuts off water when pump is disengaged.

4 **FELKER MODEL 364**—Identical to the Model 254 but equipped with a 36 hp Wisconsin engine for extra heavy duty operation.



FELKER MASONRY SAWS—The masonry saw with the completely replacable spindle quill. Gives new-saw performance with a 10 minute on-the-job replacement.



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(Continued from page 48)

sun, dry it out as quickly as possible. By loading over a large surface, the contractor was able to handle a considerable amount of pay yardage.

Several types of rolling brought the soil to required density. Two large sets of sheepsfoot rollers, a Bros 50-ton compactor, a Tampo self-propelled pneumatic machine, and a Hyster grid-type roller were all used. All the equipment did a good job, according to project manager Bud Nesbitt, and the Hyster worked exceptionally well on this particular soil, developing the 95 per cent density required in a 6-inch lift in about eight passes.

Final subgrade shaving was done by Caterpillar No. 12 motor graders. When the top of the grade was level with the surveyor's blue tops, set in place by Corps of Engineers' men, the subgrade was ready to receive the 20-inch granular subbase. This lies under all paved areas of portland-cement concrete in the runway ends, warmup pad, and parking apron. Grading and subbase work were identical for the taxiways, which will have a plant-mix surface.

A Parsons Trenchliner and a Rex truck-mixer combine to make work move fast on duct-line trenches in the field. Both rigs work close together, the mixer chuting concrete to the ditch as soon as the lines are laid.

Rock-production problems

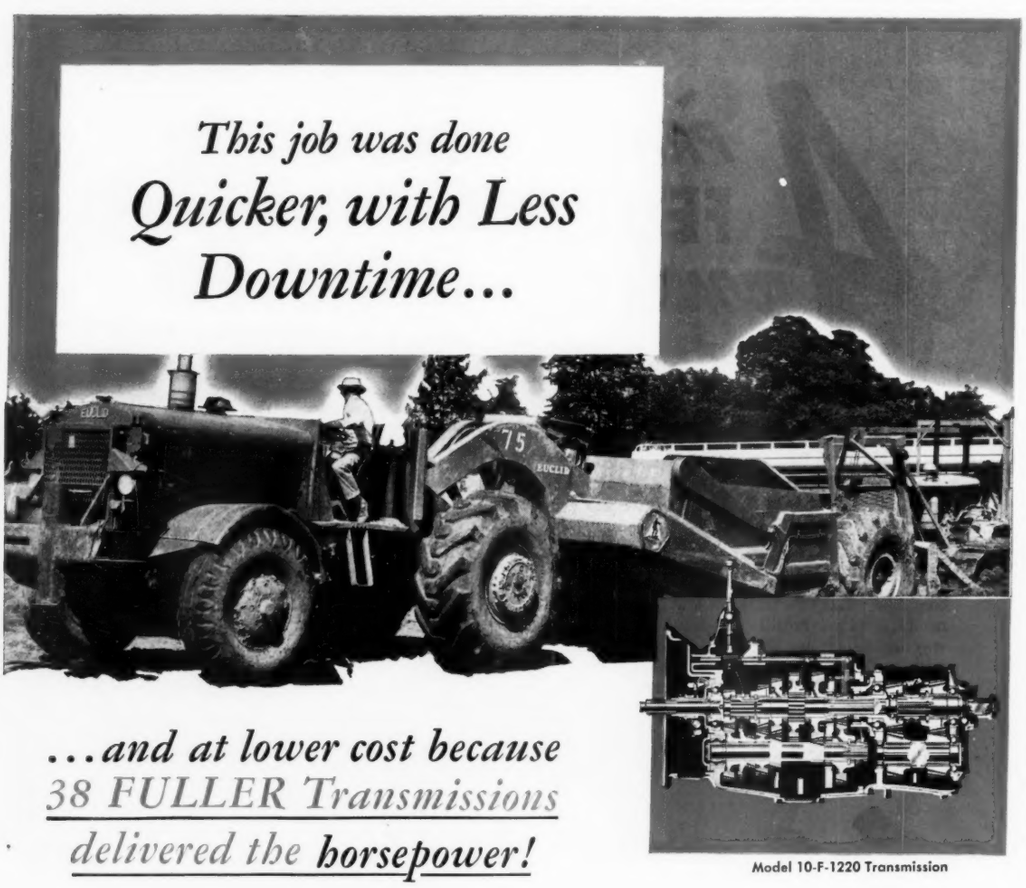
One of the unusual features about the Malmstrom project was that the granular subbase turned out to be a quarry job—a unique job in the west—and that it was necessary to install a washer on the plant to hold the minus-200 mesh fraction within the 5-per-cent-maximum limits established by the specifications. Until the washer was installed, fine dust generated during crushing exceeded the limit.

The rock formation the Corps of Engineers picked as a source of subbase material was of flat bedded standstone in relatively thin layers. While it crushed easily, the rock is extremely abrasive. The whole quarry area had to be drilled and shot to a depth of about 20 feet to establish digging banks for two power shovels—a Link-Belt Speeder and a Northwest—which loaded broken stone into the Euclid end-dump and two Koehring Dumptors hauling to the rock-crushing and screening plant.

To produce the heavy tonnage required, Nilson-Smith and Northwestern set up what was probably the largest rock plant operating in Montana. Completely new, it consisted of Universal primary and secondary equipment. Rock was first dumped to a large feeder trap equipped with a Universal apron-type feeder. The plates of the feeder brought the rock, as needed, over a 4 × 8-foot grizzly screen having a fine mesh that removed most of the minus ⅜-inch material at that point. This was also the first step in getting excess 200-mesh fines out of the final mix. Most of the rock, retained on this grizzly screen, dropped off to a 4650 impact breaker that reduced the size of the particles rapidly.

Once past the impact breaker, the rock passed by conveyor belt to a dual set of double Simplicity screens that began the classification of material. Rock larger than 1½ inches, the biggest size for upper course base, passed to a 54 × 24 roll crusher. This and the double-screen deck were arranged in closed circuit by a conveyor system that recirculated the rock until it all met specification limits. The larger-size particles passed directly to storage bins. But after the crushing process had been finished everything finer than ⅜ inch was screened out by the screen-deck system and routed to an Eagle twin-screw washer 36 inches × 25 feet.

This job was done
Quicker, with Less Downtime...



...and at lower cost because
38 FULLER Transmissions
delivered the horsepower!

Model 10-F-1220 Transmission

On the three sections of the Ohio Turnpike totaling 12.1 miles near North Royalton, Ohio, for example, the Cook Construction Company of Jackson, Mississippi, used 8 of these 14TDT Euclid Motor Scrapers of 18 yard capacity, equipped with 10-speed Fuller 10-F-1220 Transmissions to speed up the earthmoving. The scrapers are powered by NHS 600 Cummins 275 hp engines.

Cook Construction also used 30 Model 4FDT Euclid Bottom Dumps with Fuller 5-A-920 Transmissions, powered by Cummins NH 200 hp engines, in moving the 6,000,000 yards involved.

Says P. E. Maxsween, Equipment Superintendent: "Whenever I have a choice I *always* specify Fuller Transmissions because I like the way they stand up on the job." Maxsween also likes Fuller Transmissions because they get the job done faster, more efficiently, at less cost and with less downtime.

Cook Construction Company, subcontractor to T. L. James Company of Ruston, Louisiana, on the Ohio Turnpike job, has moved the Fuller Transmission equipped earthmovers to a section of the Kansas Turnpike near Wichita, for which they are prime contractors.

In Kansas, as in Ohio or elsewhere, Fuller Transmissions are putting horsepower to work, efficiently . . . profitably.

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Water for the operation of the washer was piped to the plant from Malmstrom Air Base about 1½ miles away.

The Eagle sand screws washed out the 200-mesh material, which was carried out a waste trap through flumes leading to stilling ponds. Several ponds were used so that water had time to clear, permitting its reuse. The ponds were dug out by a Lima dragline, and the dirty waste water from the sand scrubber routed in. When water in a stilling pond reached the top of the dike, wash water was routed to another pond. The solid particles soon settled, and Rex centrifugal pumps raised the clear water to help supply the sand washer.

The entire Universal plant was driven by electricity, with a total of about 870 horsepower being supplied by all motors. The plant had a push-button control system that extended even to the truck-loading platform, which used a stacker conveyor to load trucks heading back to the air base. The plant had two principal storage bins—one for coarse and one for fine material. Syntron feeders at the bottom of these bins permitted blending to be done constantly so that a consistent product, meeting specifications, was delivered at all times. This blending, and the other measures taken to remove objectionable fines, made it literally possible to dump any material into the plant and secure a consistent product.

Laying subbase

To prevent segregation and to obtain uniform lifts, the contractors used a Jersey spreader mounted on a Caterpillar tractor to distribute the granular material. Haul trucks backed to this unit and dumped gradually into a hopper as they were shoved ahead by the machine. Moisture presented no problem here because the blending of dry rock and washed fine product gave the material moisture at optimum or slightly above.

The compaction equipment purchased by the contractors has worked well on this material, even on the upper 3 inches, where 100 per cent density is specified. On the upper 3-inch lift, a new Buffalo-Springfield Kompactor, purchased specially for work on the crushed-rock base, brought the rock particles to their maximum density in 6 to 8 passes.

The top course was finished almost to exact tolerance, since excess rock left at this stage would have required extensive fine-grading later on. Also, grade lines of the finished top could not be left low. The contractor finished this phase of the work by setting surveyor's stakes and check points in the top of the material, and finishing the grade to these points by tight blading with motor graders. Some pneumatic rolling by the Tampo self-propelled rubber-tire machine finished the surface to perfect density.

Final completion of the Malmstrom Air Force Base improvement is scheduled for the late fall of 1956. Since the base is located in an area where the construction season is short, and where even summer weather is sometimes not too favorable, it appears likely that the work will go on well through the latter part of next season. THE END

ARBA names committee for 1957 road show

The publicity committee for the 1957 road show sponsored by the American Road Builders' Association has been completed. Members, drawn from the advertising, manufacturing, and publishing fields, will serve under the chairmanship of Harvey A. Scribner, president of Russell T. Gray, Inc., industrial advertising firm of Chicago, Ill.

Representing national and regional construction publications are: Donald V. Buttenheim, president and publisher of CONTRACTORS AND ENGINEERS; G. L. Anderson, of *Construction Bulletin*; J. D. Bowler, Jr., of *Southwest Builder and Contractor*; E. E. Weyeneth, of *Construction Methods and Equipment*; and G. C. Stewart, of *Constructioneer*.

A. W. Lehman of Richard T. Brandt, Inc., Cleveland, Ohio, and H. K. Kenyon of Andrews Agency, Inc., Milwaukee, Wis., will represent advertising agencies.

Representing manufacturers are Don Fricker, of the Heil Co., Milwaukee, Wis.; M. B. Jaeger, of Bucyrus-Erie Co., South Milwaukee, Wis.; Lloyd Rager, LeTourneau-Westinghouse Co., Peoria, Ill.; William A. Rundquist, Pioneer Engineering Works, Minneapolis, Minn.; and J. M. Gates of the Galion Iron Works & Mfg. Co., Galion, Ohio.

Ex-officio committee members are Kenneth Lindsay and Harold Hess, president and executive vice president, respectively, of the Construction Industry Manufacturers Association and Julien Steelman, chairman of the road show board.

The show will be held at the International Amphitheatre in Chicago on January 26 through February 3, 1957.

Barnes Mfg. appoints sales promotion manager

Managing sales promotion for the complete line of pumps made by Barnes Mfg. Co., Mansfield, Ohio, is Paul E. Finical. He will also be responsible for advertising on the entire line.

COMPLETE PILE DRIVING UNIT ON CRAWLERS: To obtain a minimum safe bearing of 75 tons, 12 WF 74 piles were driven to average 170′ depth by splicing 65′ lengths. The compact driving rig was devised because of the limited area adjacent to heavy traffic. Union Building & Construction Corp., Passaic, N. J., contractor.

Jaeger Rotary fits tight spot on Turnpike

Widening the New Jersey Turnpike between Secaucus and Ridgefield involved driving piles to 170′ depth in a very limited working area adjacent to heavy turnpike traffic. The job was done "with excellent results" by mounting a Jaeger 600 "Roto" compressor on the crane, the Jaeger rotary being compact for mounting *and easily able to maintain constant full pressure in the Vulcan No. 1 hammer by direct feed.*

Contractors who use Jaeger Rotaries for pile driving frequently describe their operation as "*smooth as steam*". This is because Jaeger engineers have devised faster-acting, closer-regulating controls to hold pressure constant under fluctuating demands. All speed modulation is smooth and stepless. There is never any over-run or racing of the engine. Your Jaeger "Roto" also operates at slower speeds than other rotaries, using less fuel and undergoing less wear. For complete data, call your Jaeger distributor or send for Catalog JCR5.

Jaeger Roto Air-Plus® "600".
125 and 365 cfm units also available.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 257

distributor doings

A successful dealership?

It's all in the ingredients

by WILLIAM T. DARDEN, assistant editor

The Eau Claire headquarters building houses administrative and business offices (left), and a fully-equipped repair shop (rear, right). The second story (front) is a recent addition.

If it's a recipe for a successful dealership you're looking for, here's one that's been tried and proved by one upper midwestern distributor:

Take one ambitious immigrant's ideas and mold into a small culvert-manufacturing firm;

Gradually add construction equipment lines;

Stir the organization vigorously from time to time, now and then adding new and younger personnel to the management;

Season generously with AED suggestions and business aids;

Combine above ingredients with a careful check on such factors as cost, inventory, and sales;

Spread out over one entire state and part of another;

Top with a major tractor line.

Incidentally, cooking time on the above receipe is 50 years, but when you consider that the result is five to six million dollars annually in sales volume, the time spent seems well worth it.

All of the above is by way of introducing the Bark River Culvert & Equipment Co., Eau Claire, Wis., which this year is celebrating its 50th year of business, and of mentioning right at the outset the factors which the firm credits for its success.

Now if you're thinking to try the recipe, it's best to tell you that some of the ingredients are optional—and some are not. You may not, for example, have an immigrant founder handy. Or a culvert-manufacturing firm. You may not be ready to spread out over a whole state or more. Even the major tractor line may be beyond your reach at present. All of these are expendable.

But two ingredients are vital, the Bark River outfit feels, to this and

Select Earth Compaction Equipment Wisely

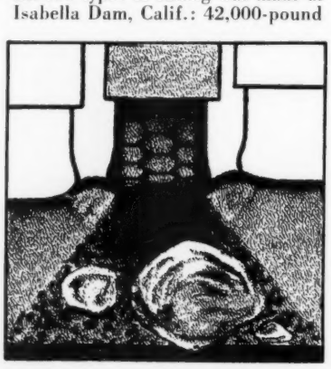
The right equipment assures a job well done at low cost.

Nothing is more important in compacting an earth fill than the proper selection of equipment well chosen; the right equipment produces modern density requirements of the engineer at relatively low cost to the contractor. In a few jobs, it is true, the earth can be used uncompacted. In others, the sheepsfoot roller has a definite place; however, on the highest-type fills, the heavy duty rubber-tired compaction roller has demonstrated its outstanding ability to densify heavier lifts with fewer passes than any other equipment. In fact, the development of pneumatic rolling in the past 12 years has made it possible to build fills faster and far better than ever before.

That is why, in our mind, the heavy rubber-tired pneumatic compaction roller represents the greatest contribution to soil compaction in recent years. In 1932, contractors began to notice that loaded scrapers, far heavier than the "sheepsfoot tamps" then in use, delivered high compaction in the area under the tires. The modern pneumatic compactor sprang from this basic observation.

COMPARING METHODS

The first direct comparison between the two types of rolling was made at Isabella Dam, Calif.: 42,000-pound



Southwest Rollers compact lifts 24" thick permitting rocks, cobbles to be incorporated in fill without removal.

sheepsfoot rollers were used on the first dirt contract; pneumatics with 20,000 pounds of weight per wheel and 80 psi tire pressure on the second job. Twelve sheepsfoot roller passes were made on 12-inch lifts on the first job. On the second contract, a Southwest C-50 Compactor made 6 passes on 18-inch lifts. In both cases, 70% of the tests went over 94% of Modified AASHO density. On this job, incidentally, a Southwest Giant Ripper was used for the first time to loosen and pre-wet the borrow pit.

Fill compaction achieved by sheepsfoot roller and Southwest compaction roller. The substructure is 975 feet long and 95 feet from bedrock.

Later, pneumatics also proved their ability where water was scarce—in dry desert sand on 2-inch lifts, they gave a fair degree of compaction under conditions considered almost impossible.

Because the Southwest Compaction Rollers generally will handle thicker lifts than a sheepsfoot, rocks or cobbles can usually be incorporated into the fill without undergoing the expense of their removal. They will also compact a fill at a higher moisture content than a sheepsfoot roller. The ponderous weight of their heavily loaded pneumatic tires overcomes pore pressures in the soil, squeezing some of the excess water up to the surface where it can evaporate. Furthermore, tests have shown that such a pneumatic-rolled fill has unusually good ability to shed rain water.

Engineers and construction authorities have concluded from tests that most earth-fills can be compacted by heavily loaded rubber-tired compaction rollers with about half the number of passes and for about half the cost of comparable results with the sheepsfoot.

OBSOLETE SPECIFICATIONS

The truth is that the superior performance of pneumatic rollers such as built by Southwest has made many specifications obsolete — specs which call for one roller for each 150 cubic yards of fill per hour hauled in. Southwest Compaction Rollers can handle considerably larger amounts.

For a really high-type compaction job, compaction equipment needs weight, and it should be adaptable to a wide range of tractors. If pneumatic, its wheels should deliver the same constant load pressure regardless of ground contour. It should have full-oscillating weight boxes, so that there is absolutely no bridging or shifting of load. Weight boxes and tire pressure should offer the utmost flexibility. Standard 4-section units should be built so that they can be quickly converted to 3, 5, or 6-unit rollers in a minimum of time.

The unit should be able to compact 12-inch lifts with the same ease that 6-inch lifts were compacted, preferably in from 4 to 6 passes, and at greater speed than has ever been possible before. The ever-increasing density and CBR requirements on 1956 model fills make it necessary to use the finest modern processing and compaction equipment to get a good job done swiftly, and at a profit.

WRITE TODAY!

For illustrated folders on the finest compaction roller equipment developed to date.

SOUTHWEST WELDING & MANUFACTURING CO.

Construction Machinery Division

ALHAMBRA, CALIFORNIA

Advertisement

For more facts, use Reader-Reply Card opposite page 18 and circle No. 258

Executives of the Bark River organization are pictured at the ceremonies opening the new Milwaukee branch building. From left: Joe Lindner, general sales manager; Fred Lindner, Green Bay branch manager; John Lindner, Sr., president; Ben Douglas, secretary; John Lindner, Jr., vice president and general manager; William Berglund, treasurer.

Direct-mail advertising for the six branches (with a combined mailing list of approximately 5,000 customers) is handled at the Eau Claire headquarters. An addressograph machine (left foreground) and a postage meter speed this operation.

any other recipe for distributorship growth and success: the use of services offered by the AED, and the check on cost, inventory, and sales (which means management control). The first explains why John Lindner, Jr., vice president and general manager, is so interested (and active) in the Associated Equipment Distributors; the second explains how a dealership with outlets in six towns can operate efficiently and profitably.

Lets take a look at these two ingredients as this midwestern distributor sees and uses them.

Puts AED aids to use

Probably the greatest indication of his interest in AED is the fact that John Lindner, Jr., devotes a large part of his time to his duties as director of AED Region 7 (Wisconsin, Michigan, Illinois, and Indiana). Nor is he an AED supporter in name only; the firm puts to good use many of the service offered by the distributor organization.

Periodically, the Bark River company compares its financial statement with AED's Cost-of-Doing-Business report—and takes note of the results. Regional, multi-regional, and annual meetings are always red-letter dates on John Lindner's calendar. And the AED magazine, *Construction Equipment News*, is read carefully each month at the main office and all branches.

In John Lindner's opinion, the most important AED project at present is the Used Equipment Survey. With the cooperation of distributors around the country, this project aims at compiling market values of used equipment. The Bark River company, for one, is eagerly awaiting the published results of this survey, for it sees such information as valuable not only to the dealer but to his customers as well.

The Industry Round Table and joint AED-AGC Committee also are valuable activities, John Lindner feels, providing as they do cooperative action and better understanding between dealers and manufacturers and between dealers and contractors.

As for the other indispensible ingredient—careful management control—the Bark River firm couldn't

(*Continued on next page*)

The relief valve on a full-flow filter serves as a safety factor, pure and simple. If the filter element clogs, the valve opens so that the bearings will not have to run without any lubrication at all.

But . . . don't let this safety function of the relief valve lead you to think you can get along with substitute filter elements that have less than the requisite capacity for your diesel's lube oil system.

Every time the relief valve opens, dangerous, abrasive-laden oil pours into your engine. Sure, it's better than *no* oil, but it doesn't take much of it to start serious bearing wear.

Your International-Harvester dealer-distributor knows that inadequate filtering can ruin precision parts in a matter of hours. That's why he makes a point of giving you only manufacturer-approved replacement filter elements built to I-H's exacting engineering standards by Purolator.

WARNING TO DIESEL USERS:

pay attention to your full-flow filter element refills

International UD-24 and UD-18 diesel engines power a 30-inch rock pulverizer.

PUROLATOR PRODUCTS, INC., Rahway, N. J. and Toronto, Ontario, Canada

For more facts, use Reader-Reply Card opposite page 18 and circle No. 259

This modern plant houses the Milwaukee branch of the Bark River company. The building was dedicated at open house ceremonies last November. Note glass-enclosed display room (rear, right).

operate without it. Since the Eau Claire office is the headquarters for this company, purchasing, advertising, sales direction, and record-keeping are centralized there. Daily, weekly, and monthly reports are carefully tabulated so that management can see at a glance how these figures compare with the past, with each other, and with other comparable companies.

Besides its Eau Claire headquarters, the company has branches at Milwaukee, Madison, and Green Bay in Wisconsin, and Ironwood and Bark River in the Upper Peninsula of Michigan. (The company actually was founded at Bark River, but with expansion it was decided to move the headquarters to the more centrally located Eau Claire).

Large Inventories

This considerable territory means, besides more than five million dollars' worth of sales annually, an inventory of approximately one million dollars' worth of new equipment spread among the six outlets, a total parts inventory estimated at nearly half a million dollars, a mailing list of approximately 5,000 customers, and a total permanent personnel of more than 125. These figures mean big business—and Bark River's operation is just that.

International Harvester equipment is Bark River's big line. Others include Hough, Drott, Galion Iron Works, Pettibone-Wood, Union Wire Rope, Universal Engineering, and Otto Biefield (snowplows). And since the firm makes its own culverts and drainage products (accounting for a minor portion of the annual sales volume), this constitutes an additional service for customers in the two-state area.

Heading the Bark River company since 1950 (he joined the firm 27 years ago as sales manager) is John Lindner, Sr. John, Jr., his eldest son, is vice president and general manager. Another son, Joseph, is sales manager for the entire organization, while a third, Fred, manages the Green Bay branch. The firm, it is evident, is pretty much a family affair.

Other officers of the firm include B. E. Douglas, secretary, and W. K. Berglund, treasurer.

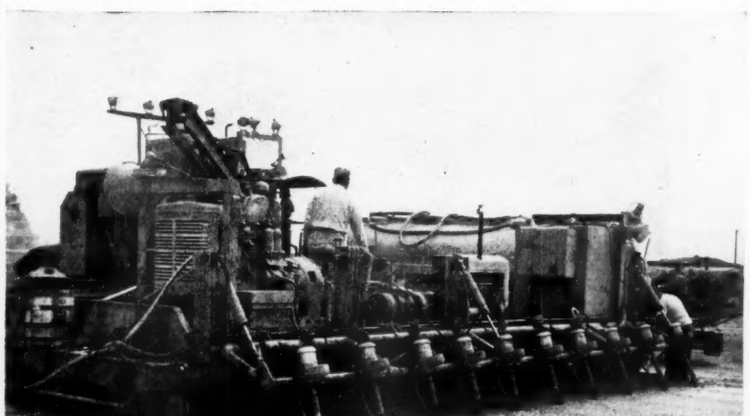
In the 40 years since the first equipment line was taken on by the Bark River firm, expansion has accompanied growth. Only a few years ago the Madison branch was created. Improvements have not been lacking, either; a new Milwaukee branch building was opened late last year, and a new plant at Escanaba, Mich., to replace the Bark River branch is now nearing completion.

But unlimited expansion is not part of this particular recipe. Bark River feels its territory is large enough as it is, and probably will not add any more branches. But further development of the present territory is quite another thing, and it will probably be many a year before the firm feels sales have reached a desirable limit.

Purchasing, advertising, sales direction, and management control of the

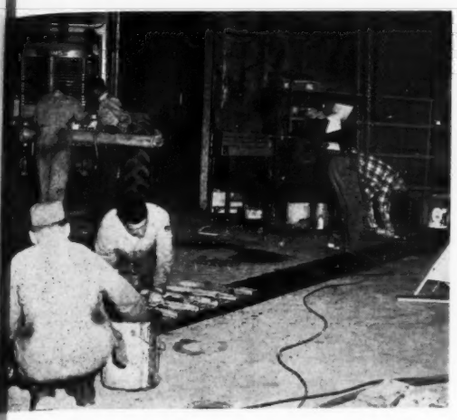
A PICTURE REPORT OF
INTERNATIONAL POWER
Boosting job production everywhere

Morrison-Knudsen Co. and Landers & Griffin Inc., joint venturers on $17,000,000 Portsmouth (New Hampshire) Air Base, are laying 423,000 cu. yds. of concrete with this spreader. Its 10 International-powered vibrators continuously work a strip 25 ft. wide, 14 inches thick. All concrete is being laid for 200 x 11,620 ft. runway and 1,000 x 8,500 ft. apron. Also on the 5,788,000-yd. job are 6 TD-24 torque converter pushers and 16 self-propelled scrapers. Their output on 10,000-ft. cycles averages 1,400 pay yds. hourly.



This International "300" tracto
economically doing a job norm
assigned a much bigger, more exp
sive machine . . . moving 1000
yds. Heaping 8 cu. ft. of sandy lo
per load, it completes a 100-ft. c
every 1½ minutes. "300" is build
a running track for a school in Gr
ville, Mississippi, will take 7 to 10 d

3000-ft. cycle every 3 min. is
record of Western Construction C
"55" Payscraper. This includes t
for TD-24 to push-load 10 pay y
of ripped caliche. Area, near El P
Texas, was once considered too st
and rocky for development. S
thanks to International power, it
be graded and terraced for
quarter-acre lots.



In the Eau Claire repair shop, mechanics change the pads on TD-24 crawler tracks. At left background, an Adams 610 grader gets an overhauling. Moore one-ton overhead hoists do lifting jobs in the shop.

whole company are all carried on at the Eau Claire headquarters. A leased wire teletype setup enables the branches to communicate with each other as often as necessary. Salesmen (there are 16 divided among the six offices) hold separate branch meetings monthly, and get together for an over-all meeting every 60 days. Thirty-seven service men hold down the well equipped shops at the six outlets. Well trained parts men are available for 24-hours service at each plant. The average parts inventory per branch is, incidentally, about 100,000 items—of which about 70,000 are for the International line.

Dealer Techniques

The firm doesn't do much rental business, believing that this only creates competition for its sales efforts. Equipment auctions are something it hasn't felt the need for, since it is a company policy to keep the used equipment inventory at a minimum. New equipment is demonstrated for prospective customers by specialists in the several major types of equipment, but Lindner admits you have to watch this. "The fellow who asks for repeated demonstrations with a view to getting a little work done free still turns up now and then."

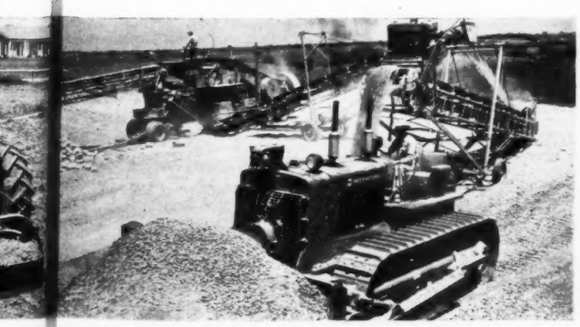
Direct-mail advertising is, of course, a big activity with the Bark River outfit, but John Lindner has an opinion that this—like some other distributor techniques—can be overdone. He is a firm believer in advertising, but wonders sometimes if the volume of direct mail literature that is sent out ever gets read.

Datewise, Bark River's history can be condensed into a single paragraph. Founded in 1906 by Ole Harsted, a lumberjack who had come to this country and to Michigan from Norway, it built its first branch (Eau Claire) in 1913, took on its first equipment line (Adams graders) in 1915, added the Lindners in 1929, became an International Harvester distributor in 1939, and added its fifth branch (Madison) in 1950.

But these are only dates—and a mere handful of the more important ones, at that. In between and continuing today is the story of sound distributorship practices—which, to those who are in the business, is the only success story in this precarious field.

Whether you're telling the Bark River story or trying out the recipe yourself, don't forget those two important ingredients: AED and careful cost control. THE END

"Ideal for dozing rock," says Paul Weaver, Supt. for Joe Wenke Quarries, of this veteran TD-14A. "We use it continuously for shovel and quarry-floor cleanup. Performance has been excellent. Downtime is way down, due partly to rugged construction, partly to prompt parts delivery service from our International distributor." Quarry, located at Toledo, Iowa, produces 200 tons of 1-inch road stone per hour.



Fast on job, fast between jobs—Handling all tractor work in a quarry near Denver, Colorado, 200 hp TD-24 saves time by driving job-to-job at 7.8 mph. Output, 2200 tons of 1¼-inch stone per 8-hour shift, is taken from crusher by International-powered belt conveyor, background, then stockpiled by TD-24. Unit also does all stripping.

Ripping 150 yds. of concrete in front of a Camden (New Jersey) filling station was a job too tough for a ¾-yd. shovel, according to engineers. Al Pangia's International Drott TD-14A, however, did the work unassisted. Unit's tremendous break-out force, 17,000 lbs, broke up the slab . . . even tore out 5-ft. concrete footings.

International
makes every load a pay load

INTERNATIONAL HARVESTER

Industrial Power

A machine size for every job . . . see your nearest INTERNATIONAL DISTRIBUTOR for details.

PAYSCRAPERS
CRAWLER TRACTORS
DIESEL, GAS ENGINES
WHEEL TRACTORS

ALSO: International Drott Loaders . . . International Scrapers, Bottom-Dump Wagons . . . and International Superior Pipe-Boom Tractors.

New Manitowoc dealers

Two new domestic and two foreign dealers for the power crane and shovel line have been appointed by the Manitowoc Engineering Corp., Manitowoc, Wis.

The J. D. Coggins Co., Albuquerque, N. Mex., will serve the northern counties of the state, and Caprock Machinery Co. of Amarillo will handle the northern portion of Texas. Foreign dealers are Reicco, C. A., Caracas, Venezuela, which will cover the entire country, and the Walter S. Wolff Co., Stockholm, Sweden, will be responsible for sales in the Scandinavian countries.

Personnel of all four dealers will be trained in the Manitowoc factory.

Pioneer dealer in Florida

Finn Machinery Co., Orlando, Fla., is a new distributor of Pioneer Engineering Works, Inc., Minneapolis, Minn., a subsidiary of Poor & Co., Chicago, Ill. The firm makes the Continuflo line of feeding, crushing, washing, and material-handling equipment used in construction.

The dealer, covering the northeastern part of the state, has its main

←For more facts, circle No. 260

office at 1342 W. Church St., and a branch office at 3755 N. W. 25th St., Miami.

Euclid opens school for service personnel

Training courses covering maintenance and servicing of Euclid equipment will be conducted at the General Motors Training Center in Denver, Colo., from January 16 through April 13. Open to all owner and dealer service personnel, the classes will include the study of production models.

Information and enrollment applications are available from Euclid dealers or the Service Training Department, Euclid Division of General Motors Corp., Cleveland 17, Ohio.

Radio transmission sets simplify dealer service

Another use for radio has been devised by Weaver Tractor Co., Sacramento, Calif., representative of Caterpillar Tractor Co. of Peoria, Ill. Weaver has installed Motorola radio equipment in its main store in Sacramento, and in its three branches, located anywhere from 30 to 60 miles away. Designed for intrastore communication between employees of all departments, the system will be used primarily by the parts department to locate needed parts in other stores. In effect, the radio will place a parts inventory of all stores at the customer's disposal.

Operator Margaret Esperson makes a call on the radio system linking the three branches of Weaver Tractor Co. Extension handsets similar to this keep the firm's branches in constant touch.

Weaver's radio system consists of a console transmitter in the main store, a console desk-type set in each of the branches, and a repeater transmitter located on Mt. Vaca, 47 miles away. To place a call from one store to the other, the operator pushes a button, and a signal goes out to the store called. Only the store called can listen in on the transmission. Pilot lights at all stations indicate which of the stations, if any, is busy. Operators are not required to be licensed by the Federal Communications Commission, and they may use the radio equipment as they would a telephone.

A Memphis, Tenn., Caterpillar dealer has also adopted the radio system to speed emergency parts service. A parts man on stand-by duty after the store has closed carries a pocket-size receiver over which he can receive messages from Alexander's Answering Service, Memphis, which takes the company's calls after regular store hours. The Alexander operator broadcasts the order to the parts man, who frequently will drive the order to the customer himself.

Clark Equipment adds four new distributors

Three dealers in the United States and one in Canada have been appointed distributors of the line of transmissions, torque converters, and axles manufactured by Clark Equipment Co. at automotive division plants in Buchanan and Jackson, Mich.

John M. Shank Co., White Bear Lake, Minn., will cover Minnesota, Wisconsin, Nebraska, Iowa, and the upper peninsula of Michigan, and the H. A. Davis Power Equipment Co., Dallas, will cover the nothern half of Texas.

New England, New York, New Jersey, eastern Ohio, Pennsylvania, Delaware, North and South Carolina, Virginia, and West Virginia will be supplied by Brunken Corp., Ashtabula, Ohio. Richler Bros., Montreal and Toronto, Canada, will cover the provinces of Ontario and Quebec.

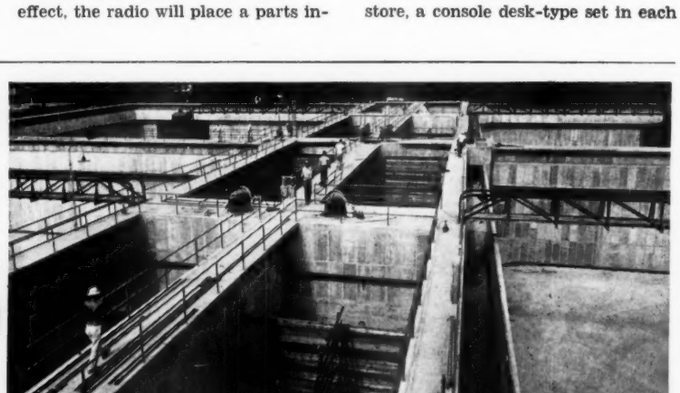
All dealers will provide complete sales and service facilities.

Griffin promotes three

Three promotions within the organization have been made by the Griffin Equipment Corp., New York, N. Y. The new general manager of the firm is James S. McConville, who will be assisted by the newly appointed Vincent C. Giuliano. LeRoy C. Baxter was appointed district representative for New Jersey.

Griffin is the New York distributor for the Detroit Diesel Engine and

How Pre-Fab Forms Saved Time, Material On Water Plant Job



New coagulation basins to increase capacity of Louisville Water Company facilities in final stages of construction.

Contractor Forms 200,000 sq. ft. contact area with 14,000 sq. ft. of panels

Forming a 350′ square water basin with exterior and interior walls 31′ high presents no problem to the experienced contractor. But, when the job must be done in minimum time at lowest possible cost to meet tough pouring and finishing specifications, careful planning and operation are required.

When the Henry G. Bickel Company and the Charles A. Connel Company were awarded the contract for the massive Louisville Water Company coagulation basins at Louisville, Kentucky, they selected the Uni-Form Panel System to form the 200,000 sq. ft. of contact area the job required.

Forming started fast, because the Uni-Form Panel System is ready to use when it reaches the job. Valuable time, labor and material savings were made because Uni-Form Panels require minimum alignment and bracing on 1 side only. The Uni-Forms were assembled and locked into a tight, rigid form with Uni-Form Ties supplied in exact lengths to provide automatically accurate thickness of both battered and straight walls.

One side of the form was erected, permitting easy, unhampered placement of reinforcing. Since specifications did not permit the use of chutes or tremies, pouring pockets were provided as the forms were closed to maintain positive control of concrete placement.

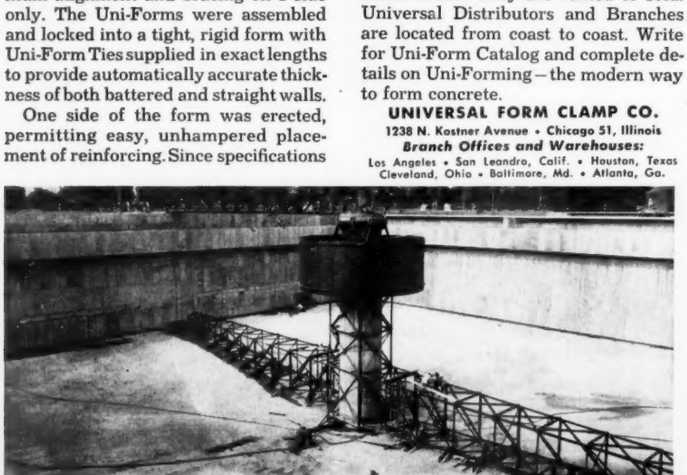
Fast erection and stripping features of the Uni-Form System enabled the contractor to form the entire 200,000 sq. ft. of contact area with only 14,000 sq. ft. of Uni-Form Panels. Panels were used an average of 14 times without the necessity of maintenance or repair.

The simplicity of the Uni-Form Panel System, together with the services provided by Universal Form Clamp Co., insured fast job progress and satisfactory completion under the capable supervision of Harry Hunter, Supt.

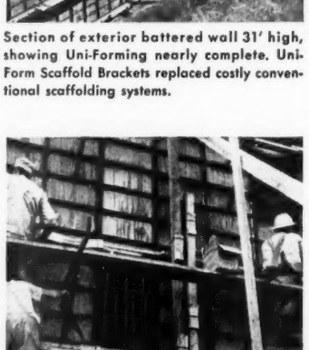
Uni-Form Panels are versatile, high speed forming tools. They're used by the country's most successful contractors to form every conceivable type of construction. They are rented or sold. Universal Distributors and Branches are located from coast to coast. Write for Uni-Form Catalog and complete details on Uni-Forming—the modern way to form concrete.

UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue • Chicago 51, Illinois
Branch Offices and Warehouses:
Los Angeles • San Leandro, Calif. • Houston, Texas
Cleveland, Ohio • Baltimore, Md. • Atlanta, Ga.

Section of exterior battered wall 31′ high, showing Uni-Forming nearly complete. Uni-Form Scaffold Brackets replaced costly conventional scaffolding systems.



View of one of four clarifiers showing smooth-surfaced, clean walls which required no further finishing.



Pouring pockets permitted specified control of concrete placement.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 261

Delco Division of General Motors Corp., and for the Gorman-Rupp Co. of Mansfield, Ohio.

H. O. Penn executive dies

Stewart A. Wade, executive vice president and co-owner of the H. O. Penn Machinery Co., New York, N. Y., died suddenly at his home on November 5. Mr. Wade had joined the Penn organization as a salesman in 1936, and at the death of Hamilton O. Penn, he and Ralph L. Johnson purchased the firm.

A member of the Hartford Club, the Circus Saints and Sinners, and The Moles, Mr. Wade is survived by his wife, a son, and a daughter.

Euclid dealer in South

The Ray C. Call Co., South Charleston, W. Va., has been appointed an authorized dealer for the complete line of earthmoving equipment manufactured by the Euclid Division of General Motors Corp., Cleveland, Ohio. The firm's territory is comprised of Garrett and Allegany counties in Maryland and all but five West Virginia counties.

B-E dealer covers central New York

Central New York State, from the Pennsylvania border to the St. Lawrence River, is the territory Syracuse Supply Co., Syracuse, N. Y., will cover as a new dealer for Bucyrus-Erie Co., South Milwaukee, Wis. Sales and parts service on B-E excavators and cranes will be offered by the new dealer in 17 counties. The firm maintains headquarters at 294 Ainsley Drive in Syracuse.

Marion Power Shovel appoints new dealer

The complete line of shovels, cranes, draglines, and related equipment manufactured by Marion Power Shovel Co., Marion, Ohio, will be distributed by Mork-Witthauer Equipment Co., Minneapolis, Minn. The new dealer, located at 2518 University Ave. S. E., will maintain a stock of repair parts for Marion and Osgood-General machines. Fred Mork is president of the firm, and Ray Witthauer is vice president and treasurer.

Buck Equipment officer dies suddenly at home

Floyd Snyder, executive vice president and salesman of the Buck Equipment Corp., Cincinnati, Ohio, died suddenly at his home in Cincinnati. He had been with the firm since its founding in 1922. Mr. Snyder also served as a director of the Office of Price Stabilization in Indianapolis.

Duval Equipment appoints

Jay A. Guggenheim has been appointed secretary of the Duval Engine & Equipment Co., Cleveland, Ohio. A former sales manager for the company, he has been in charge of the firm's expanded sales force.

Greer Hydraulics appoints midwestern distributor

Greer Hydraulics Inc., Jamaica, N. Y., has named Hydro-Air Inc., St. Louis, Mo., distributor of bag-type hydro pneumatic accumulators and other hydraulic products. From headquarters at 1315 S. Vandeventer Ave., Hydro-Air will service Missouri, Nebraska, Kansas, western Iowa, and southern Illinois.

Baldwin-Lima-Hamilton names new distributor

The construction equipment division of Baldwin-Lima-Hamilton Corp., Lima, Ohio, has named the Krider Equipment Co., Fargo, N. Dak., a distributor of Lima shovels, cranes, draglines, and pull shovels. Krider's territory covers the entire state of North Dakota and Clay, Norman, and Wilken counties in the State of Minnesota.

Cleaver-Brooks dealer

Erickson Industrial Products Co., 6234 Peeler St., Dallas, Texas, has been appointed Cleaver-Brooks representative for the sale of boiler equipment. The company's territory will include 58 counties in north-central Texas.

HRB book advances theory on ungraded aggregates

Bulletin 109 of the Highway Research Board, "Ungraded Aggregates in Bituminous Mixes", advances and supports a theory in which ungraded aggregates may be used in mixes for low-cost road construction. The authors, Ladis H. Csanyi and Hon-Pong Fung, hold that thin films of bituminous binder on minute particles of mineral dust form a bituminous mortar for binding ungraded aggregates into a bituminous mixture suitable for paving.

Originally presented at the thirty-fourth annual HRB meeting, in January, 1955, the bulletin is liberally illustrated with photographs, charts, and diagrams. A list of references appear at the end of the text.

Priced at $.90, the booklet is available from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

ROLL CRUSHER PRODUCTION TIME DOUBLED...

using Stoody Semi-Automatic Wires

Roll wear encountered in crushing extremely hard blue granite rock to critical specifications was limiting production at Arizona Sand and Rock Company's portable plant, near Phoenix. Every hour of running time had to be matched with an hour down for maintenance of the rolls! Days just weren't long enough to produce tonnages required and still keep equipment in shape... at least not by ordinary methods.

To avert an impending aggregate bottle-neck, management turned to the new Stoody semi-automatic hard-facing process, set up as a routine repair technique. Time required for maintenance was immediately cut in half... and the hours gained each day were converted to a much needed second production shift!

Low spots on the pair of 40" x 22" rolls are nightly built up as necessary with Stoody 7/64" diameter Manganese. Corrugations are capped with Stoody 100. Both of these alloy materials are supplied in tubular wires for semi-automatic application. High deposition rates—7 to 15 pounds per hour—are several times faster than manual welding. Considerably less heat input is required than by other methods. Deposits are sound and free from porosity. No flux or flux dams block the weldor's view and stub end losses are eliminated.

By permanently installing the semi-automatic welder as part of the crushing equipment no time was lost preparing for nightly maintenance.

If you have maintenance problems on any of your heavy equipment, we'd suggest that you ask your Stoody dealer (check the "yellow pages") for new literature on STOODY ALLOY TUBULAR WIRES, or write direct.

STOODY COMPANY

11936 East Slauson Avenue
Whittier, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 262

Convention calendar

January 11–14 American Road Builders' Association
Annual Convention and 1956 Highway Materials and Supplies Exhibit, Miami Beach Municipal Auditorium, Miami Beach, Fla. Norman T. Almquist, administrative services manager, ARBA, World Center Bldg., Washington, D. C.

January 12 National Constructors Association
Meeting, Plaza Hotel, New York, N. Y. C. B. Bronson, secretary, NCA, 50 E. 41st St., New York, N. Y.

January 12–14 Associated General Contractors of Minnesota
Meeting, St. Paul Hotel, St. Paul, Minn. R. J. Hendershott, manager, AGC of Minnesota, 910 Builders Exchange Bldg., Minneapolis, Minn.

January 17–20 Highway Research Board
Thirty-fifth Annual Meeting, Sheraton-Park Hotel, Washington, D. C. Fred Burggraf, director, HRB, 2101 Constitution Ave. N. W., Washington 25, D. C.

January 29–February 2 Associated Equipment Distributors
Annual Convention, Conrad Hilton Hotel, Chicago, Ill. P. D. Hermann, executive secretary, AED, 30 E. Cedar St., Chicago, Ill.

February 6–8 Georgia Quality Concrete Short Course
Fifth Short Course of Instruction, Auditorium, School of Architecture, Georgia Institute of Technology, Atlanta, Ga. Professor Radnor J. Paquette, School of Civil Engineering, Georgia Institute of Technology, Atlanta.

February 13–15 Association of Asphalt Paving Technologists
Annual Meeting, Hotel Cleveland, Cleveland, Ohio. Ward K. Parr, secretary-treasurer, AAPT, 1224 East Engineering Bldg., Box 376, Ann Arbor, Mich.

February 13–16 Associated General Contractors of America
Meeting, Waldorf-Astoria Hotel, New York, N. Y. C. I. Mehl, administrative assistant, AGC of America, 1227 Munsey Bldg., Washington 4, D. C.

February 13–16 National Sand and Gravel Association and National Ready Mixed Concrete Association
Convention and Biennial Show, Conrad Hilton Hotel, Chicago, Ill. Vincent P. Ahearn, executive secretary, NSGA, 1325 E St. N. W., Washington 4, D. C.

February 13–18 Danish National Institute of Building Research
Rilem Symposium on Winter Concreting, Danish Institute of Civil Engineers, Copenhagen, Denmark. The Organizing Secretary, Rilem Symposium, c/o The Danish National Institute of Building Research, 20 Borgergade, Copenhagen K, Denmark.

February 15–17 High-Speed Computer Conference
Meeting, Pleasant Hall, Louisiana State University, Baton Rouge, La. Dr. J. W. Brouillette, director, General Extension Division, Louisiana State University.

February 17–18 National Society of Professional Engineers
Spring Meeting, Statler Hotel, Washington, D. C. Paul H. Robbins, executive director, 1121 15th St. N. W., Washington 5, D. C.

February 20–22 National Crushed Stone Association
Thirty-ninth Annual Convention in conjunction with NCSA Manufacturers' Division Exposition, Conrad Hilton Hotel, Chicago, Ill. J. R. Boyd, secretary, NCSA, Manufacturers' Division, 1415 Elliot Place, Washington 7, D. C.

February 20–23 American Concrete Institute
Meeting, Bellevue-Stratford Hotel, Philadelphia, Pa. William A. Maples, secretary-treasurer, ACI, 18263 W. McNichols Road, Detroit 19, Mich.

February 23–24 Highway Engineering Conference of the University of Colorado
Conference, University Memorial Center, University of Colorado, Boulder, Colo. Roderick L. Downing, conference chairman, 207 Engineering Building No. 1, University of Colorado.

February 23–25 Concrete Contractors Association
Midwest Concrete Exposition, Morrison Hotel, Chicago, Ill. Ted Dahlstrom, managing director, MCE, 139 N. Clark St., Chicago, Ill.

February 27–March 2 American Society for Testing Materials
Meeting, Hotel Statler, Buffalo, N. Y. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

February 28–March 1 Illinois Annual Conference on Highway Engineering
Meeting, Illini Union Building, University of Illinois, Urbana, Ill. John W. Hutchinson, assistant director, IACHE, 201 Civil Engineering Hall, University of Illinois.

February 29–March 2 Assoc. of Highway Officials of North Atlantic States
Meeting, Statler Hotel, Boston, Mass. Kenneth D. Rice, assistant secretary, 1035 Parkway Ave., Trenton, N. J.

March 1–2 Illinois Traffic Engineering Conference
Meeting, Illini Union Building, University of Illinois, Urbana, Ill. John E. Baerwald, director, 401 Civil Engineering Hall, University of Illinois.

March 5–7 Utah Highway Engineering Conference
Meeting, Union Building, University of Utah, Salt Lake City, Utah. A. Diefendorf, conference director, University of Utah.

March 6–10 American Concrete Pipe Association
Forty-eighth Annual Meeting, Broadmoor Hotel, Colorado Springs, Colo. Howard F. Peckworth, managing director, ACPA, 228 N. LaSalle St., Chicago, Ill.

March 12–16 National Association of Corrosion Engineers
Annual Conference, Hotel Statler, New York, N. Y. A. B. Campbell, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

March 18–24 American Congress on Surveying and Mapping and American Society of Photogrammetry
Consecutive Meetings and 1956 Coexhibit, Shoreham Hotel, Washington, D. C. F. G. Williams and W. A. Radlinski, co-chairman, ACSM–ASP, Box 470, Washington 4, D. C.

April 3–4 Earth-Moving Industry
Conference, Pere Marquette Hotel, Peoria, Ill. F. Norris, housing chairman, E–MTC Research Department, Caterpillar Tractor Co., Peoria.

April 3–5 Ohio Highway Engineering Conference
Tenth Annual Conference, Student Union, Ohio State University, Columbus, Ohio. Emmett H. Karrer, general chairman, Brown Hall, Ohio State University.

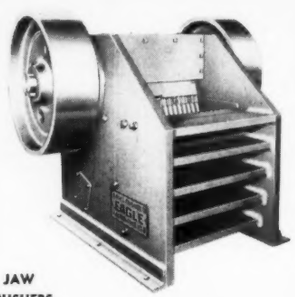
April 4–6 American Society of Lubrication Engineers
Annual Meeting and Lubrication Exhibit, William Penn Hotel, Pittsburgh, Pa. William P. Youngelaus, Jr., administrative secretary, ASLE, 84 E. Randolph St., Chicago, Ill.

April 12–14 American Concrete Agricultural Pipe Association
Sixth Annual Meeting, Brown Palace Hotel, Denver, Colo. Howard F. Peckworth, managing director, ACAPA, 228 N. LaSalle St., Chicago 1, Ill.

EAGLE EQUIPMENT FITS INTO

Eagle Crushers

Portable Eagle crushing plant operated by Harry Miller Contracting Co., Suffield, Ohio, delivers pit run sand and gravel at rate of 100-125 yds. per hour for cushioning concrete super-highway nearby. Whole layout can be moved as gravel is consumed. (Power source is electric generator set—could be gasoline or diesel direct drive.)



JAW CRUSHERS

HAMMER-MILLS

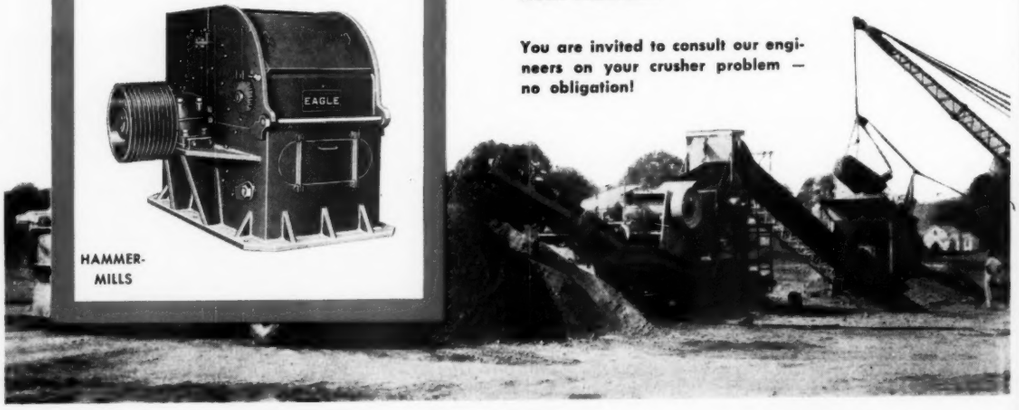
RUGGED CRUSHERS

Economy-minded contractors are looking more closely at ways and means of producing and handling aggregate of superior quality and at lower cost. Eagle equipment fits into that need.

Eagle Crushers—both jaw type and hammermill—bear the characteristic marks of the experienced manufacturer—simple design, durable construction, ease of servicing. Eagle originated the one-piece, electrically welded frame—has pioneered in the field of portable, compact, crusher plants like the one above.

There is a range of sizes in the jaw crusher—and a variety of styles (skid-mounted, trailer, portable, roadside). Likewise, the hammermill or impact breaker is made in several sizes and for various applications—is particularly well suited to limestone reduction.

You are invited to consult our engineers on your crusher problem — no obligation!



Portable heating unit rated at 200,000 Btu

■ A new portable heater with a rated capacity of more than 200,000 Btu per hour is announced by the Lennox Furnace Co. The heating unit is the same used in Lennox furnaces; consequently, it can be serviced by any heating dealer.

The Lennox Heat Wagon is readily portable, and is recommended for keeping men or materials warm during wintertime construction, whether indoors or outside. The weight of the unit is distributed so that it may be wheeled like a wheelbarrow by one man.

A 19-gallon self-contained fuel supply enables the unit to operate 12 hours continuously at top output. Gases are exhausted through an opening at the top of the unit, and an extension may be added to this opening to carry gases outside a building.

For further information write to the Lennox Furnace Co., 1701 E. Euclid Ave., Des Moines 13, Iowa, or use the Request Card that is bound in at page 18 of this issue. Circle No. 153.

THE CONSTRUCTION PICTURE

Highway Builders

SPEEDY LOADERS

Eagle truck-mounted loaders are doing yeoman duty around many construction jobs and in many state highway departments. Wherever stockpile handling is involved—wherever windrow material is to be loaded—an Eagle Crusher can pay its way—and then some!

Why do men who know like Eagle Loaders?

1. They handle any loose material—sand, gravel, stone, cinders, snow, etc.
2. It takes only one man to operate an Eagle. Controls are so arranged that the driver steps to control platform—has everything in easy reach.
3. They travel from job-to-job, or around the yard, at truck speed. No sluggish crawler pace for an Eagle!

Send for more information, prices. Eagles may be just the equipment you need to give you the leading edge on competition!

EAGLE

JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS

CRUSHER CO., Inc. GALION OHIO·U·S·A

For more facts, use Reader-Reply Card opposite page 18 and circle No. 263

Standard rig works safely on dangerous refinery job

Safety measures become particularly important during repair or construction work at any oil refinery because of the maze of buried and above-ground pipes. But the Sun Oil Co., has minimized this problem by using the Multi-Purpose Gradall 40 to 50 hours a week for earthmoving jobs near piperuns at its Marcus Hook, Pa., refinery.

Since these pipes carry gases and flammable liquids, breaking a line during construction could lead to a disastrous fire. The Gradall reduces the accident hazard because it can dig between and under lines safely and can be accurately controlled. At the present time, two Gradalls are being used in the construction of fire walls around storage tanks.

Finishing the banks around the storage tanks and repairing old banks around existing tanks, work formerly done by hand labor, is the primary work of the Gradall on this job. The unit also shapes and grades dirt unloaded by end and bottom-dump trucks at the approximate location of the walls.

Relocating buried main arteries is another big job for the Gradall, which can be used to excavate over the top of lines. Trenching, backfilling, ripping, and hand-finishing and cleanup work complete the roster of Gradall work at the site.

Transmission manual

■ An illustrated service manual covering its most widely used transmissions is available from the Service Department of the Fuller Mfg. Co., Transmission Division, Kalamazoo, Mich. Complete service information, including disassembly and reassembly instructions, on Fuller Models 5-A-33, 5-A-330, 5-B-33, and 5-B-330 is included, along with step-by-step instructions.

To obtain this manual write to the company, or use the Request Card at page 18. Circle No. 156.

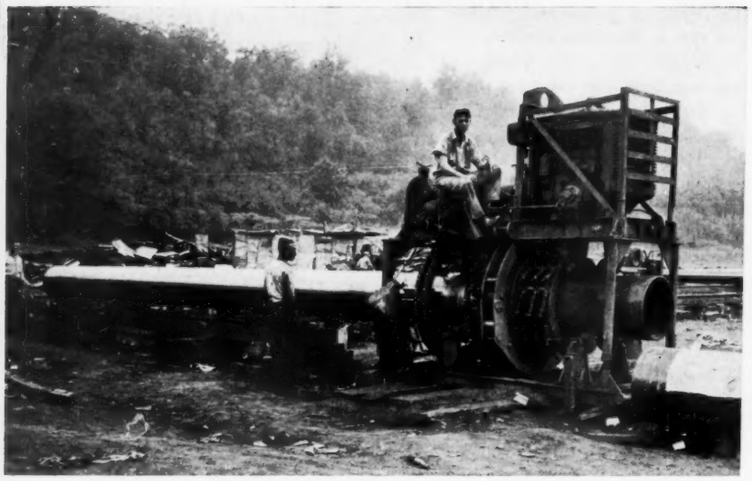
Diesel generating plants

■ Universal Motor Co., 428 Universal Drive, Oshkosh, Wis., has incorporated in a folder all information on Universal engine details and generator specifications. Photographs and presentation of sizes, speeds, models, and all general specifications on its line of diesel generating plants are arranged in an easy-to-find manner, making a suitable selection quick and positive for any size plant ranging from 8 kw up.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 191.

Garrett executive changes

J. C. Garrett, president and founder of The Garrett Corp., Los Angeles, Calif., has been elected chairman of the board of directors. He will be succeeded as president by W. C. Whitehead, former executive vice president of the firm.



Moving through the M-Y-C cleaning and priming machine in the Eastview, N. Y., yard of Bechtel Corp., San Francisco, Calif., a pipe section is simultaneously cleaned of rust and given a prime coat of coal tar. It will be pushed on an elevated rack, background, to dry. *C&E Staff Photos*

Pipe is bent by a C-R-C upright vertical bending machine to conform exactly with a bend measured in the trench. Powered by an International engine, the rig can make a 2-degree bend per pull. A Cat MD7 Pipe Layer supports emerging pipe with a Trackson side boom.

Bending and coating precede the laying of gas pipeline

Numbered and lettered sections are hauled 5 miles from yard to prepared trench for a 91-mile section of 24-inch line

by ANTHONY N. MAVROUDIS, field editor

Numbered and lettered to correspond with a section measured in the trench, a pipe section is picked up by a Caterpillar tractor with Trackson side boom and loaded on a stringer truck for the five-mile haul to the right of way.

Supported by a Cat tractor with Trackson side boom and Superior calipers, the 24-inch pipe is given a bead weld. When this is finished, the pipe will be laid on the 4 x 6 timbers being made ready by the workman in the foreground.

Bending and coating 40-foot random sections of 24-inch pipe in one yard, then marking them numerically and alphabetically so that each section can be delivered to the trench in predetermined order is rarely done on pipeline projects. But Bechtel Corp., San Francisco, Calif., did just that to supply two pipeline spreads on a 91.1-mile section of the 225-mile line being built for the Tennessee Gas Transmission Co., Houston, Texas.

This 225-mile section of the natural gas pipeline will tie in and extend an existing line now terminating at the company's Hebron, Pa., underground storage cavity, bringing it through Pennsylvania, New Jersey, and New York, to Greenwich, Conn. At Greenwich it will connect with the southern end of an existing pipeline in New England, which curves back to Mercer, Pa. When the new section is completed sometime next fall, the entire line will make a 1,000-mile closed loop originating at Mercer, giving the New York City-northern New Jersey metropolitan area an additional 2,019,500 MCF per day from the gas-producing fields in southwest Texas.

Work on the 91.1-mile section from Greenwich to a point just west of the Delaware River in Pennsylvania was

begun when Bechtel set up two bending and coating yards last June. One was located at Eastview, N. Y., in Westchester County. The other, just west of the Hudson River, supplied pipe for the Delaware and Hudson River crossings.

Random lengths of pipe, not less than 30 feet or more than 40 feet long, were supplied from the Lorain, Ohio, plant of National Tube Co. Division of U. S. Steel Corp., and shipped by rail to Orangeburg and Eastview, N. Y., for transportation by stringer truck to the job.

As the pipe joints were delivered to the Eastview yard, they were placed on an elevated ready rack consisting of two rails with a roller bed at one end. When a joint was ready to be scraped, cleaned, and primed, it was rolled onto the roller bed leading into the cleaning and priming machine, a Model "S-R", manufactured by the Morris-Young-Owens Co., Houston, Texas. The machine's automatic circumferential wire brushes scraped the outside of the pipe, removing all rust scales. As the joint was cleaned, it was pulled through the machine, receiving a prime coat of coal tar for its entire length. Then the pipe joint was fed onto another roller bed on the other side of the machine, and workmen pushed it onto another elevated rack to dry. The racks on either side of the priming machine made handling of joints an easy task.

After the prime coat had dried, the pipe joint was rolled along the rack and fed over a second roller bed at the opposite end of the drying rack into the coating machine. Here the joint received a coat of hot coal tar enamel and a coat of Fiberglas. It was given another coat of hot enamel and glass and wrapped with perforated felt in one operation immediately afterward. This machine also scraped 8 inches clean on either end of the pipe to facilitate field welding. Leaving the coating machine, the joints were placed on cooling boards and checked for breaks by detectors operating at 14,000 to 15,000 volts. If any were found, the outside felt covering was removed and the coating patched by hand.

Enamel, delivered to the yard in a solid state and in drums, was chopped up and placed into two Littleford hot dope kettles. The 23-drum-capacity kettles were kept at a temperature of 400 degrees to melt the material.

Cleaning, priming, and coating at the Eastview yard was handled by Pipe Protection Service, Inc., Elizabeth, N. J. Specializing in this type of work, the company coated about 150 pipe joints every 9 hour day.

(*Continued on next page*)

The restricted right-of-way made welding difficult along many stretches. Here, Ford trucks with Lincoln 300-amp shield arc welders have to ride in the shallow riverbed of the Bronx River.

Since no excavating could be done between the piers of the New York Central railroad bridge, a 30-inch casing is used to get the line under the Bronx River. A Bucyrus-Erie 22-B used a clamshell for the 26-foot excavation, while a wellpoint system kept the excavation dry.

Bury it! Forget it!

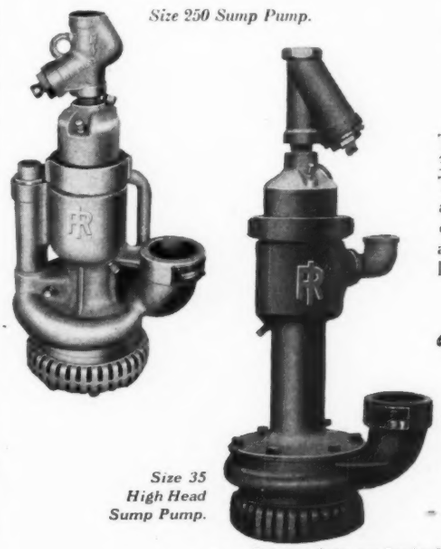
Yes, here's a Sump Pump that you can bury . . . forget it . . . and run it for days. A dry sump cannot hurt this pump. For pumping more liquids . . . faster . . . higher . . . cheaper . . . use an Ingersoll-Rand air operated Sump Pump.

These pumps are powered by Ingersoll-Rand "Multi-Vane" air motors which have an unequaled reputation for reliability. Put these dependable Sump Pumps to work for you earning extra profits. They will pump as much as 340 gallons per minute and will handle heads up to 150 feet.

This Ingersoll-Rand centrifugal type Sump Pump is the cheapest way to move water, oil, sewage or medium sludge. It's air operated for economy. No need for a standby operator. It consumes a minimum of air. On heads of more than 40 feet air consumption is as much as 30% less than comparable units.

Write today for complete money saving information on this remarkable Sump Pump.

Size 250 Sump Pump.



Size 35 High Head Sump Pump.

The I-R air operated Sump Pump is available in Sizes 250 or 35. Both types are lightweight for easy carrying by one man. They use dirt-and-liquid-protected bearings for the impeller and motor rotor. All parts are made of bronze, stainless steel, or rust-proofed steel. The Size 250 can also be supplied with an all-bronze exterior when used in corrosive or inflammable liquids.

use the IR CONTRACTORS' COMBINATION

18A-293

Ingersoll-Rand

11 Broadway, New York 4, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 264

A Greenlee pusher gets an 80-foot-long 36-inch casing under the Bronx River Parkway, which had to be kept open to traffic. A workman inside breaks up earth with hand tools powered by a Chicago Pneumatic 200 air compressor, and a cart carries material outside for dumping. *C&E Staff Photo*

(Continued from preceding page)

Pipe-joint markings

While joints were being completed, two separate crews, one on the main line and another on a spur to be used by the Consolidated Edison Co. of New York, Inc., New York City, were at work. Surveying teams for each spread staked the path of the line, allowing a Bucyrus-Erie backhoe and a Lorain crane with clamshell to excavate the trench. Ingersoll-Rand wagon drills, powered by Chicago Pneumatic and Gardner-Denver air compressors, drilled the rock encountered along the route.

Each surveying team was also furnished with a list showing the joint lengths, which had been numbered, lettered, and stockpiled in separate areas for use by the two crews. Each team, working with this list, measured out the lengths available in the prepared trench. Whenever a vertical or horizontal bend, or a combination of the two was needed, the exact point of the bend was staked and the distance recorded. Then, knowing the distance from one stake, (which marks the end of a joint) to the point of the bend, determining the angle of the bend, and knowing the exact length of the joint, the engineer could go back to the yard and mark up the corresponding joint with crayon.

These markings showed what type and how much bend was required on that particular joint. On either end of the joint scheduled to be bent, the engineer also drew an arrow to make sure the joint would be properly positioned beside the trench. Straight sections required no marking.

After being bent to the desired degree, joints were stacked in numerical sequence by Caterpillar MD7 Pipe Layers with side booms, then shipped in consecutive order to the right-of-way on stringer trucks.

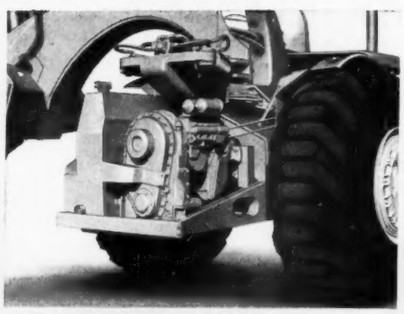
This system of numbering and lettering joints to correspond with markings on two end stakes made it impossible to make a mistake in laying the pipe sections. The length and marking of joints permitted end stakes to be properly marked and placed. After placing stakes and determining which joints needed to be bent, the engineer returned to the yard, located the joints in question, and marked the amount and point of the bend required. No joint ever had to be returned to the yard for additional bending once it was delivered to the right-of-way.

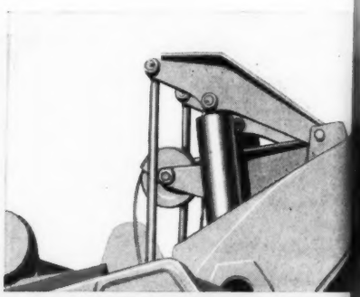
Joints were bent by a C-R-C upright vertical bending machine in the Eastview yard. Powered by an International engine and equipped with a Tulsa winch, the machine was capable of making a 2-degree bend per pull. Joints were fed to the machine by a Caterpillar MD7 with a Tracson side boom. The maximum bend for a 40-foot joint having a wall thickness of ½-inch is 30 degrees with this type of bending rig.

Field operations

Though work on the line was simplified to some degree, crews ran into several difficult problems. One occurred on a stretch of the Consolidated Edison spur, where the pipeline had to bend and run under a N. Y. Central railroad bridge crossing the Bronx River in White Plains, N. Y. Since the railroad did not allow any excavation to be done under the bridge, the contractor had to resort to driving a 30-inch casing under the riverbed and between the bridge piers. This required a trench 26 feet deep and approximately 100 feet long. Excavation was carried out by a Bucyrus-Erie 22-B crane with a clamshell. Before the casing could be driven under the riverbed, the Bronx River was made to flow through four 24-inch flumes carrying the water over the path of the casing. Wellpoints to keep this path free of water were spaced far enough apart to allow for the unobstructed passage of the casing. A Crose boring machine, powered by an I-H diesel and having

MORE WORKABILITY WIT





ADVANCED DESIGN

Euclid's advanced desig away with cable headaches—costly time for replacement and repair. All scraper operations . . apron and ejector . . . are actuated by husky lever independent hydraulic control. They're fast and positive interconnected in any way. All four hydraulic jacks ar changeable . . . one spare fits anywhere!

ACCESSIBILITY

Accessibility of major components is a cost saving feature of these two new Euclid Scrapers. Easy servicing and maintenance means more working time and more payloads per day. Engine, transmission, drive axle and entire hydraulic system can be serviced or replaced in about half the time required on other scrapers. Illustration shows accessibility of the Torqmatic Drive in the S-18 Scraper.

Performance that gets More Work Don

CUTTING BLADES

The cutting blade is another reason you can count on lower maintenance costs with "Euc" Scrapers. All four sections are identical and reversible. By using a straight or drop center blade arrangement you get the most efficient loading under any job condition. Reversing or interchanging the sections . . . a very easy operation . . . provides a completely new cutting edge.

The S-12 has plenty of power and traction to pick up heaped loads in a hurry, even in sandy conditions like this.

With Torqmatic Drive and 300 h.p., the S-18 haul heaped loads up to 24 cu. yds. at fast travel speed . . . dumps on the fly.

a 30-inch auger, drove the casing with relative ease through the 26-foot overburden while another wellpoint setup kept the excavation dry.

Another casing, this one 36 inches in diameter and 80 feet long, was pushed under the Bronx River Parkway in White Plains by a Greenlee pipe pusher. This rig, attached to the end of the casing, moved forward 5 inches at a time to force the casing under the road. Inside the casing a workman equipped with air-operated hand tools broke up the earth ahead of the casing and loaded the material into a cart that could be removed and emptied. Air for the tools was supplied by a Chicago Pneumatic 200 air compressor.

All the casings driven—and there were quite a few—were left in place and the 24-inch line was pushed through them after being welded and coated. Pipe welding was handled by Lincoln shield arc 300-amp welders, mounted on Ford trucks that moved along the right-of-way with the welding crew. Following welding and an X-ray examination of the bead weld, another crew placed hot dope and the felt coating around the 16-inch exposed gap, completely sealing the weld joint.

Before the line was lowered into the trench by a pair of Caterpillar MD7 pipedozers equipped with side booms, the entire section was checked electrically. Any flaws found at this time were removed and the patching re-done.

Backfilling and tamping of the trench was done by a Cleveland Model 190 backfiller. Equipment scattered throughout the job was serviced by a Ford lube truck having eight Alemite reels for light grease, heavy grease, motor oils, gear oils, and air. The truck also carried a Wico generator driven by a Wisconsin engine and a Quincy air compressor.

Personnel

K. E. Britain was the project engineer, and C. C. Overton, chief inspector, for the Tennessee Gas Transmission Co. G. L. Poole was the superintendent for the Pipe Protection Servive, Inc., the firm handling all the priming and coating of the pipe joints. J. L. Work was the project manager for Bechtel Corp., which had E. Kennedy and M. Finnerty as superintendents in charge of the two separate spreads. THE END

NEW "EUC" SCRAPERS

THE S-12

12 yds. struck...
14 yds. at 3:1 slope . . . 16 yds. heaped at 1:1 . . . 26.5 x 25 tires . . . 218 h.p. . . . top speed loaded of 28 mph. . . . 9′ 6″ width of cut . . . makes non-stop 180° turn in 31′.

AND THE S-18

18 yds. struck...
21 yds. heaped at 3:1 slope . . . 24 yds. heaped at 1:1 . . . 27.00 x 33 tires . . . 300 h.p. . . . Torqmatic Drive with torque converter and semi-automatic transmission . . . top speed of 20 mph with full payload . . . 10′ width of cut . . . makes non-stop 180° turn in only 36′.

These two new Euclid Scrapers bring you a new high in scraper performance and low cost yardage. Both incorporate the advanced design that have made "Euc" Scrapers the fastest growing line in the industry. With lever action and 4 section cutting blades, and 16 to 18 h.p. per yd. of capacity, they load easy and travel fast. The entire power train of the S-12 and the S-18 is designed for exceptionally good accessibility.

Before you decide on any scraper for your present or future work, check the money saving features of these "Eucs". Your Euclid dealer will be glad to give you facts and figures that show why so many users have found that *Euclids are your best investment.*

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Architectural engineering articles compiled in book

New developments in building design and construction are presented in a series of studies in "Architectural Engineering: New Concepts, New Methods, New Materials, New Applications", published by Dodge Books, 119 W. 40th St., New York 18, N. Y. Not a text or a handbook, the volume is a compilation of articles of newer technical developments in the field. Articles, which contain information on many cost-cutting methods, new uses for old and new materials, new structural systems, and new mechanical and electrical equipment, are illustrated with plans, diagrams, structural details, and photographs.

The more than 90 articles have been arranged in six sections: building shell; environmental control; utilities; site planning; materials; and special problems. The first section deals with structural frames, walls, roofs, floors, and prefabrication. Air conditioning, heating, lighting, and acoustics are covered in section two; electrical systems, transportation and material handling in section three; drainage, foundations, roads, and parking in section four; and concrete, wood, wood protection, glass, plastics, and flooring in section five. The last section, dealing with special problems, includes articles on structural safety, fire and explosion protection, and planning for atomic energy installations.

Copies of the book are priced at $11.50 and may be ordered from the publisher.

Hook-on type bucket

■ Two mailing pieces from the Erie Strayer Co., P. O. Box 1031, Erie, Pa., describe and illustrate the company's hook-on-type single-line and Strayer Electric clamshell buckets. A diagram shows the outstanding features and parts of the single-line bucket. On the back of the Strayer Electric sheet is a diagrammatic questionnaire which the purchaser may fill out to help Erie select the correct Strayer bucket for the job.

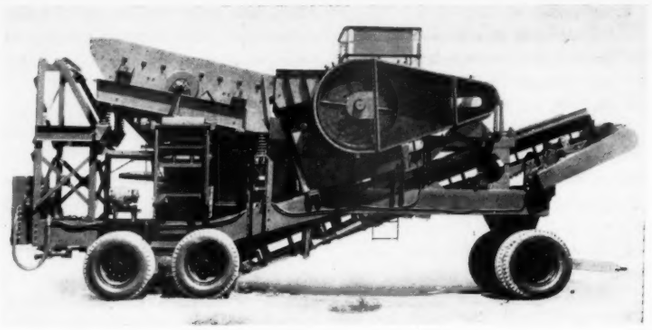
To obtain these bulletins write to the company, or use the Request Card that is bound in at page 18. Circle No. 184.

Clark Equipment expands

The Clark Equipment Co. plans to expand its Benton Harbor plant of the Construction Machinery Division by 50 per cent, by adding a 125,000-square-foot manufacturing area. The new plans climax a 100,000-square-foot expansion program started nine months ago.

←For more facts, circle No. 265

The Pioneer Model 120 JS portable crushing and screening plant is designed for use between primary and secondary crushers.



New portable crusher for intermediate stage

■ A new portable crushing and screening plant designed for use in the intermediate crushing stage has been added to the line of rock and gravel-crushing plants manufactured by Pioneer Engineering Works, Inc.

A high degree of adaptability to varying operating conditions is claimed for the new Model 120 JS. Used between a primary and a secondary crusher, it permits either feeding of larger material to the primary or increasing production by means of smaller stages of reduction in each of the primary, intermediate and secondary stages. The plant also may be used as a primary in itself, with a portable apron feeder or feeder conveyor, where pit-run is suitable.

The unit consists of a 4 x 8-foot two-deck Mesabi-type vibrating screen mounted ahead of a 2036 jaw crusher, with two delivery conveyors. Provision is made to convert the 2036 jaw into the 1536 size through use of a 5-inch spacer (available optionally), which permits smaller settings of the jaw opening. The plant may also be purchased with the 1536 jaw crusher installed as standard equipment.

The main truck has a channel frame, rear-axle equalizer, 12 pneumatic tires, and stabilizer jacks under the main frame. A semitrailer hitch and hydraulic rear-wheel brakes are optional.

For further information write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 167.

Increased flexibility for pile-driver hose

■ Increased flexibility is the feature of a new pile-driver hose announced by the Goodyear Tire & Rubber Co. Called Flexsteel, the improved hose is designed to give longer work life than similar products now on the market.

Produced in 1½, 2, and 2½-inch sizes, the hose is equipped with heat-resistant tubes and covers. The tubes have built-in resistance to oil as well as to heat. The hose is constructed of two braids of high-strength steel wire, with high-quality nylon breaker used over the second steel braid to provide better heat resistance and cover adhesion.

According to the manufacturer, Flexsteel pile-driver hose demonstrated a high degree of flexibility during laboratory and field tests.

For further information write to the Goodyear Tire & Rubber Co., Akron 16, Ohio, or use the Request Card at page 18. Circle No. 162.

Concrete pipe forms

■ Quinn Wire & Iron Works, Boone, Iowa, has published a catalog on its complete line of equipment. Details are given on bending rolls for shaping wire fabric used in the production of reinforced concrete pipe, and for concrete pipe forms for standard and special types of culverts, sewers, and manholes.

The catalog outlines the method of manufacturing concrete pipe by the wet and semidry processes, the standards set up for the production of reinforced culvert and sewer pipe, and the capacities of corrugated metal culverts and concrete pipe culverts. There are price charts and specification tables.

To obtain this catalog write to the company, or use the Request Card at page 18. Circle No. 163.

Wire-rope chart

■ A 17 × 21-inch wall chart for Acco-registered wire-rope slings lists the diameters and lifting capacities of the Strand-Laid type slings. Available from the Wire Rope Sling Department of the American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn., the chart may be displayed in maintenance shops or near cranes or hoists.

To obtain this wall chart write to the company, or use the Request Card at page 18. Circle No. 200.

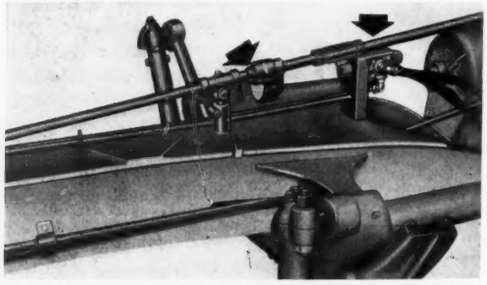
Rivinius

COST-CUTTERS FOR "CAT" 'GRADER WORK . . .

Less than $600.00 for BOTH!
GUARANTEED PERFORMANCE!

1. FULL-TIME POWER STEERING!

fits any "Cat" 'grader—Series 212, 112 and 12 (including the 9K)



Less job time . . . better job quality—that's how Rivinius full-time power steering helps your "Cat" Motor Grader put extra dollars in your pocket . . . and here's why:

- Holds wheels automatically in any position, over any terrain
- Eliminates wheel whip
- Frees operator's hands for handling blade and other controls
- Fully hydraulic
- Easy to install
- Minimum of working parts
- Vickers pump
- Valve located high above dust and other terrain hazards
- By-pass for overload

2. HYDRAULIC MOLDBOARD SHIFT

fits any "Cat" 'grader with sliding moldboard

This separate Rivinius attachment can be teamed with Caterpillar or Rivinius power steering — adding these features to your Caterpillar Motor Grader:

- Operator shifts moldboard from inside cab at the touch of a button! Makes sure position is correct for every application. More effective work on insloping or backsloping.
- Functions whether 'grader is moving or stationary.
- Moldboard can be stopped—locks—at any point—operator no longer limited to five manual slot positions.
- Moldboard moves through full 42" of travel in less than 30 seconds.
- Easy to install . . . minimum of working parts—operates from same pump as Power Steering.

Get complete facts about Rivinius Power Steering and Moldboard Shift from your Caterpillar dealer . . . or write:

Rivinius INC. EUREKA, ILLINOIS

For more facts, circle No. 266

It's the BALANCED Synclinal DESIGN

Sump Type (Cutaway) Line Type (Cutaway)

that makes
MARVEL SYNCLINAL FILTERS
American Industry's A-1 Choice

In the plants of America's industrial giants, as well as in smaller plants, Marvel Synclinal Filters are being installed on all types of hydraulic and other low pressure liquid circulating equipment. Marvels are chosen because of their excellent performance in protecting machines and increasing production by reducing down-time. They are proving again and again, their superiority in the one real test—ON THE JOB! The BALANCED Synclinal Design of Marvel Filters provides that all-important balance between maximum ACTIVE filtering area and sufficient storage space for filtered out particles—therefore, longer periods of productive operation are attained at the absolute minimum of maintenance. They meet J.I.C. Standards.

Not only plant operators, but also, OVER 600 ORIGINAL EQUIPMENT MANUFACTURERS have recognized the superiority of Marvel Synclinal Filters and now install them as standard equipment.

EASY MAINTENANCE

Both sump and line types may be disassembled, thoroughly cleaned and reassembled by any workman in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be obtained by multiple installation (as described in catalog). Choice of monel mesh sizes range from coarse 30 to fine 200.

WATER FILTERS

Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced synclinal design.

FILTERS FOR ALL TYPES OF FIRE-RESISTANT HYDRAULIC FLUIDS

Marvels most recent development is a filter for the efficient filtration of all types of fire-resistant hydraulic fluids.

IMMEDIATE DELIVERY!

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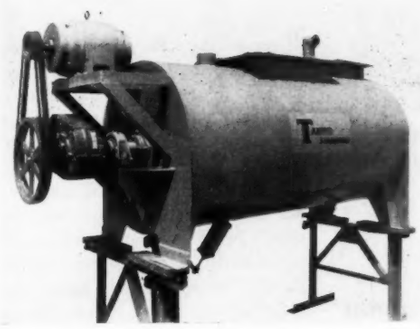
Phone: JUniper 8-6023

CE-1

Without obligation, please send me complete data on Marvel Synclinal Filters as follows:
Catalog No. 106 for Hydraulic Oils, Coolants, Lubricants
Catalog No. 300 for Water
Data on filters for fire-resistant hydraulic fluids

Name ..... Title .....
Company .....
Address .....
City ..... State .....

For more facts, use coupon or circle No. 267



This new Tampo Standard heavy-duty slurry mixer has a 63-cubic-foot capacity.

Pugmill-type slurry mixer does job in 20 seconds

■ A heavy-duty pugmill-type slurry mixer designed for use in ready-mix concrete plants is a new product of the Tampo Mfg. Co. This new mixer features a 7½-hp motor with torque arm reducer, V-belt drive, and air-operated butterfly discharge valve. Capacity is 63 cubic feet.

According to the manufacturer, the Tampo Standard mixer premixes a 6-yard slurry of cement and water in 20 seconds and supplies premixed concrete for approximately one-fifth the cost of a stationary mixer. Dry cement is never exposed to the air, and the formation of cement balls is completely eliminated, it is reported.

For further information write to Tampo Mfg. Co., P. O. Box 2340, San Antonio, Texas, or use the Request Card at page 18. Circle No. 165.

Foil-laminated vaporseal halts moisture in walls

■ A triple-ply aluminum vaporseal, Brownskin Foil Barrier, with a perm rating of 0.014 has been developed by the Angier Sales Corp., Framingham, Mass. According to the manufacturer, Brownskin halts the passage and subsequent accumulation of moisture through walls, pipelines, floors, and roofs.

Scuff-resistant and thoroughly impregnated with a special asphalt-resin compound, Brownskin is said to last as long as the building stands.

For further information write to the company, or use the Request Card at page 18. Circle No. 164.

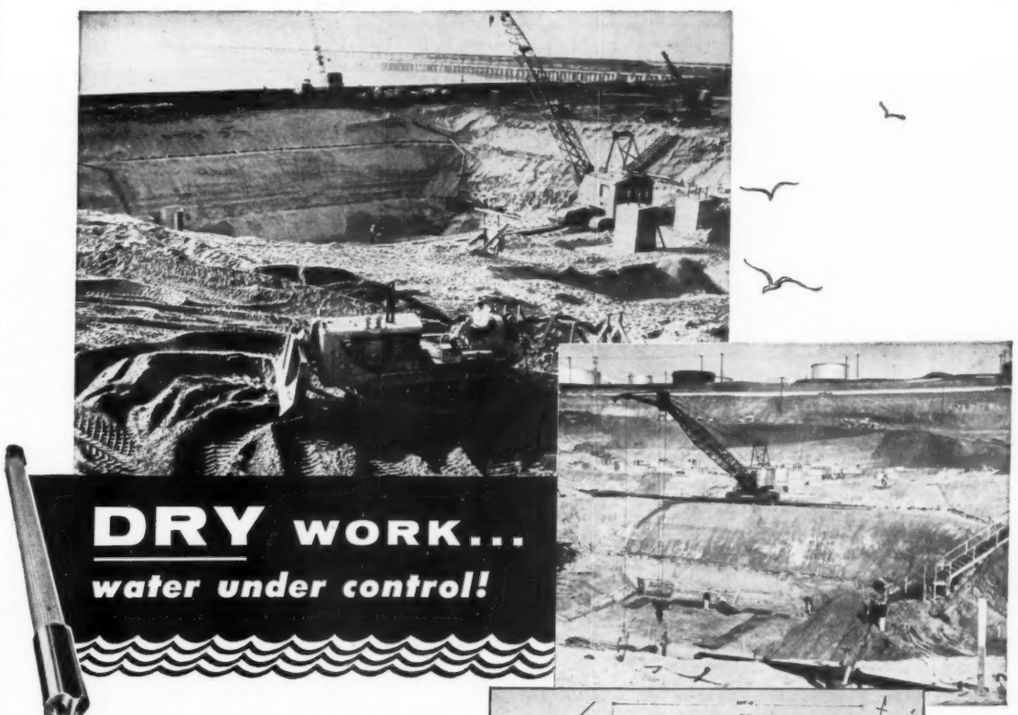
High-pressure lubricants

■ The Alpha Molykote Corp. has put out a folder on its line of Molykote lubricants. A selector chart lists the types of lubricants that the company offers in the grease-film, dry-film, and dispersion classes. Included in the list are carriers, temperature ranges, and methods of application for these various lubricants.

To obtain Bulletin 103A write to The Alpha Molykote Corp., 65 Harvard Ave., Stamford, Conn., or use the Request Card at page 18. Circle No. 195.

The National Safety Council reports that except in the gas-rationing period during the war, between 30,000 and 40,000 persons have been killed in traffic accidents every year for the past 22 years.

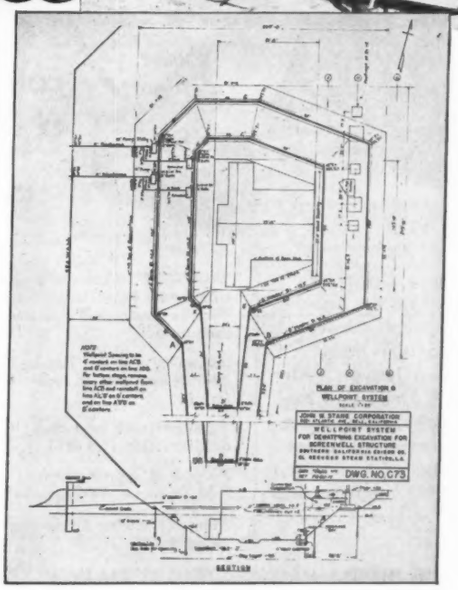
"You working the Trout River Bridge again today?"



DRY WORK... water under control!

STANG wellpoint job in beach sand... Down to 60 feet—30 feet below water level... *only 500 feet from ocean!*

Plans for an oceanside steamplant power station called for the construction of a reinforced concrete screenwell structure. Water and soil conditions were extremely adverse. The John W. Stang Corporation Engineering Service was called in. The resultant STANG plan (illustrated) *provided* completely dry excavation from the surface to a 60 foot depth . . . *utilized* dry-land excavation equipment 30 feet below water level . . . *made possible* the use of low-cost concrete forms. For fastest low-cost, construction when water is a problem . . . call STANG!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WELLPOINT SYSTEM FOR DEWATERING EXCAVATION FOR SCREENWELL STRUCTURE
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SECTION

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 268

Just what is construction management?

Adaptation of industrial management techniques raises profits as new machines and methods force a change in contracting

by: **GEORGE E. DEATHERAGE,**
Construction Consultant

Next to agriculture, the construction business is the largest single business in the nation. Yet there is practically no literature available on the subject of construction management.

A handful of books are available, but these are elementary treatises, mainly on conducting the business of house-building, remodeling, and repairing. Periodicals also carry occasional articles on the subject, but the student of construction management finds himself in an unenviable position because of the dearth of information printed on the subject. Before a student can get down to work, he has to assemble all available literature. Then after examining his selections closely, he will probably find he is far from able to get a complete picture of management in construction. At best, he will find information consisting of disconnected observations and isolated ideas.

In view of the vast amount of books, papers, and periodicals available on industrial management, one wonders why there is such a lack of similar literature available for construction. Certainly, engineers have not been idle as far as techniques of design, application, and modern production are concerned. Yet they have left the area of construction management unexplored.

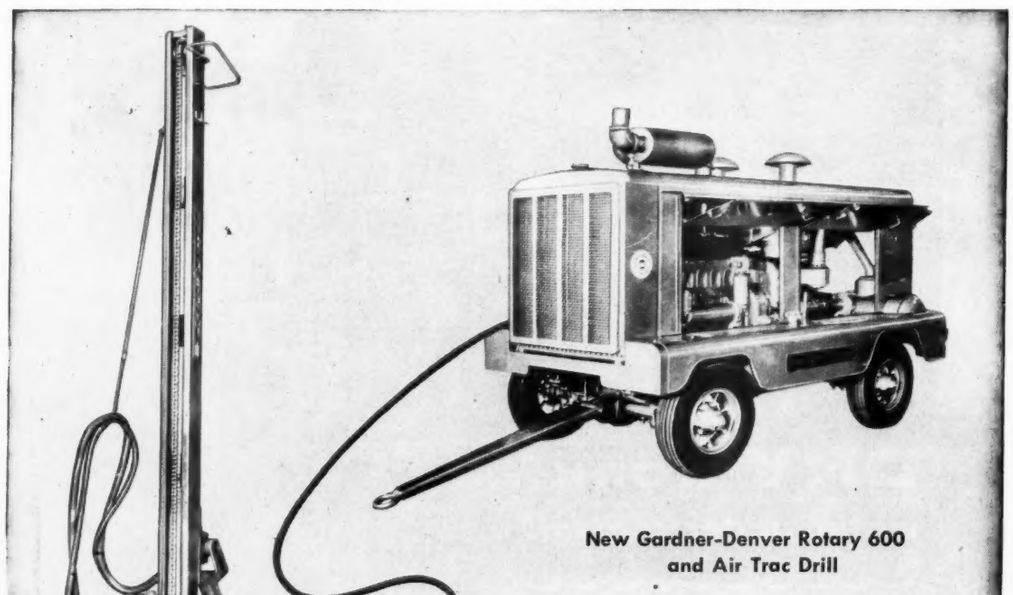
Horse-and-buggy management has been with us so long now that any sudden and complete change would be startling. Few reasons exist for this backwardness, but a multitude of excuses are offered in its defense. Some of the more common are that construction is done in intermittent operations that are rarely performed twice in exactly the same manner; that men working with tools must be compelled to do their jobs by discipline alone; and that construction is just simply different from any other business and cannot be conducted with business methods.

The truth is that management—a greater part of it made up of old-school construction men—has been so busy beating labor over the ears to get production, or fighting with labor as unions gained a toehold, that it has failed to take advantage of the lessons industrial management has to offer.

Management and skills

In formulating a program for training employees in construction management for several employer groups in recent years, I found it vital to first establish a working agreement as to what construction management really is, and what employees should be taught as part of such a program. This definition of the scope of construction management is important, because contractors generally confuse "on-the-job" skills with supervisory and management functions.

Contractors unanimously desire more production and lower costs and the great number, inclined to confine any program to the achievement of this aim, overlook the fact that in a world of men and machines, high



New Gardner-Denver Rotary 600 and Air Trac Drill

CONTRACTORS SAY:

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Here's a "one-two" punch that's a knockout to tough construction problems . . . Gardner-Denver "Air Trac"® Drill and Rotary 600, the team to use over rough terrain or city street, wherever you have the need for fast, low-cost drilling.

"AIR TRAC" takes you practically anywhere with its full traction rubber shoes. Two 5-cylinder radial air motors provide the power.

Self-stabilizing Tee Bar and chain feed drilling mast remain constant over rough terrain.

Equipped with powerful DH123 (4½") drill or DH99 (4") drill.

Furnished with Gardner-Denver Ring Seal Shanks and Sectional Drill Rods.

Pivoted Drawbar for towing compressor or service sled.

ROTARY 600, the reliable rotary with more new advantages than any other rotary.

Vital parts can be inspected and serviced in a matter of minutes.

Automatic water-cooling and circulation system warms oil before starts, maintains best operating temperature in all weather.

Metered Oil Flow assures positive lubrication, sealing and cooling under all conditions.

Thrift Meter saves fuel; wear and tear on engine and compressor.

PAVING BREAKERS • CLAY SPADERS • TRENCH DIGGERS • TAMPERS • ROCK DRILLS • UTILITY DRILLS • SHEETING DRIVERS • AIR HOISTS

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Gardner-Denver Company, Quincy, Illinois
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 269

With this issue, CONTRACTORS AND ENGINEERS begins publication of a series of articles on Construction Management by George E. Deatherage, P.E., a construction consultant with years of experience in the field of civil engineering construction. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves. In view of the great volume of construction anticipated in the years ahead, and the shortage of trained, key men in contractors' organizations, we believe this series of articles will be a real contribution to the construction industry.

production and low costs are mainly accomplished at the staff level. Today, new machines and methods have replaced individual manpower as the prime source of high unit production, and construction must be put on the machine-crew-shift basis, rather than on the basis of the amount of work an individual will do in a given time.

A unit labor cost is now made up of the hourly ownership and operating cost of machines, plus labor, insurance, fringe benefits, and similar items. It must be understood that 85 per cent of labor is now occupied in moving materials, only 15 per cent is changing the shape of materials. When cost analysis proved this to be true, it also proved that the role of the workman is a minor one for management.

Production today depends more on the kinds of materials used and whether or not they are immediately available, the machines used, the design of the work, methods of transportation, and over-all work methods.

Now a construction foreman should, of course, be thoroughly versed in the trade he is supervising, else he cannot direct others properly. But this is purely a trade skill. Training a foreman to set up his job so that it gets high production at low cost is another matter. It means planning the equipment layout, the type and number of equipment items and their location, and the location and relationship of raw materials in view of the equipment to be used and the work methods to be followed.

In the manufacturing industries, these functions are performed on the staff level. Everything is predetermined, then the foreman is instructed —sometimes through route sheets— just how the job is to be done. He is not permitted to proceed until a study has determined the most effective work method. This is where construction, with few exceptions, falls down miserably.

Contractors or project managers may, in a broad sense, determine equipment and over-all methods to be used, but the established techniques of planning through the use of flow diagrams, process charts, and work-method charts are generally ignored. As a result, many decisions are left to untrained personnel, and work methods are determined on the spur of the moment.

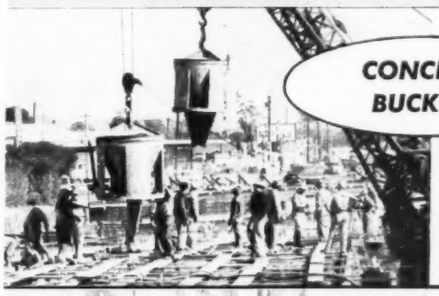
Of course, the foreman will have no control over many important functions of management, such as estimating, billing of materials, equipment selection, and many others. And he has very little business with the major part of planning and production—the selection of proper work methods. This is a staff function.

What kind of training?

I hope I have made it plain enough that the area in which a foreman operates is pretty well circumscribed. The individual at foreman level, if he determines the methods to be used in doing work and directs men and machines to achieve a desired result, is a "specialized technician". Output and field costs depend on his experience, training, and judgment. The superintendent on a construction project is also a "specialized technician", and if he operates a project removed from the main office, wherein he performs all management and office functions, he becomes a construction manager. How is he to be equipped for his job? What training does he need to operate effectively in his rightful area of authority?

Currently, colleges and universities offering regular 4-year courses in construction management are, of course, concerned with giving students a broad educational background as well as instructing them on detailed management or supervisory functions. This year, for the first time, the University of Califor-

Selection Chart FOR CONCRETE HANDLING EQUIPMENT



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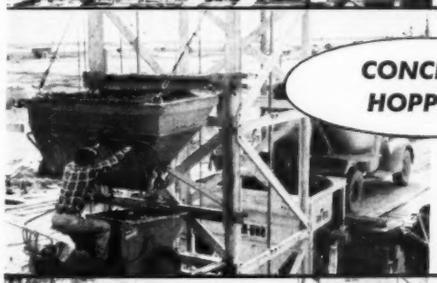
SELECT FROM 30 different Gar-Bro bucket types and sizes ranging in capacity from ⅓ to 8 cu. yds. There is a Gar-Bro bucket for all concrete mixes and aggregate sizes—standard round or laydown type buckets. Each has Gar-Bro patented, self-closing, grout tight, double clamshell gates.

Type	Capacity (cu. yds.)	Concrete Slump	Aggregate Size (Max.)	No. of Bucket Sizes
LIGHTWEIGHT	⅓ to 1½	Normal	3"	5
STANDARD DUTY	¾ to 4	Low Slump	3"	7
HEAVY DUTY	2 to 8	Dry	6"	9
LAYDOWN	½ to 3	Normal or dry	3" or 6"	9



CONCRETE HOPPERS

CHOOSE FROM 32 Models of Gar-Bro Hoppers including Receiving Hoppers and Floor Hoppers. They are used by contractors to prevent delay of truck mixer and placing crew. Serve as intermediate storage for concrete.

Type	No. of Gates	Cap. (cu. ft.)	Attachments
VERTICAL FRONT	Single	28 to 67	Collars & Stands
CENTER DISCHARGE	Single	32 to 72	Collars & Stands
VERTICAL FRONT	Double	54 to 135	Collars & Stands
CENTER DISCHARGE	Double	63 to 144	Collars & Stands

POWER CARTS CONCRETE CARTS

BUILT FOR HANDLING CONCRETE, these units can move more concrete per day than any ordinary cart. Power-carts have speed, capacity and extra maneuverability. Concrete carts are balanced to man's muscle. See them; compare them!

Equipment	Load Capacity	Maximum Travel Distance	Speed	Capacity* per Hour
POWER-CARTS	12 cu. ft.	1000 ft.	15 mpr.	15 to 20 cu. yds.
CONCRETE CARTS	6 to 8 cu. ft.	200 ft.	walking	3 to 5 cu. yds.

*according to hauling distance

PORTABLE HOPPERS

READY TO MOVE FROM JOB TO JOB these hoppers on wheels serve as concrete supply stations for cart crews; they prevent delay of truck mixers and placing crew. Two types available with either wheels or skids.

Type	No. of Gates	Cap. (cu. yds.)	Type of Gate
PORTABLE	2	2 to 3	Double Clamshell
SEMI-PORTABLE	2	3 to 4	Double Clamshell

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Concrete Handling Equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 270

nia is offering a major in construction management. This big step is the result of two years' planning on the part of the Building Contractors' Association of California in cooperation with the university.

The BCA, before giving the university a clear idea of the needs of the industry, first had to decide on the qualifications needed in those entering the field. The chief weakness in the background of the average contractor, it concluded, was overspecialization. Today's contractor, it felt, is essentially a business man who needs just enough technical knowledge of building to deal intelligently with architects, subcontractors, and specialized technicians.

The new curriculum developed for the university includes two years of liberal arts study. Later, the main emphasis is placed on basic business courses—finance, accounting, selling, production methods, management problems, law as it pertains to contracting, and real estate. Two new courses deal with construction procedures and equipment, and with construction costs. This training for men entering the field today is far different from that received by the men already in the business.

Many contractors will disagree with the conclusions of the BCA. None would consider employing a recent graduate as a construction manager until the man had served his apprenticeship, had become a "specialized technician" of one kind or another, and had become capable of supervising and directing other "specialized technicians".

While it is admitted that liberal arts courses are important, the employer is mainly interested in things it takes to run a job and make a profit. Currently, the great demand is for men who are experienced and trained in "methods preplanning" and "manpower scheduling". That, in essence, is the technique of doing construction with industrial production methods in order to increase output and lower costs.

The construction manager, in the daily practice of his employment, will necessarily have to supervise and direct several divisions in his organization, whether or not they exist as separate and distinct departments. Among these are:

1. The contract department (which includes legal phases of the work, estimating, bidding, and selling);
2. The engineering department (which includes both office and field engineering);
3. Production and planning (which includes devising work methods, the selection of equipment, scheduling, costs, and cost controls);
4. Purchasing (which includes expediting stores, and subcontract negotiation);
5. Inspection (both of fabricated work and work on site);
6. Field operations (including organization, progress, and control);
7. Industrial relations (which include personnel and personnel relations);
8. Safety (together with sanitation and fire protection);
9. Clerical and accounting;
10. Financing (including taxation).

Each of these divisions is highly specialized, and on a larger project is under the direction of a "specialized technician". All this work has to be integrated so that operations can be placed on the most profitable basis.

The question now arises, how much detailed knowledge of these divisions must the construction manager or contractor have in order to supervise operations intelligently? The more a man knows of the details of work in each department, the better technician he is and the more efficient will be his management. If he does not have enough technical knowledge in one particular field, he will have to depend on his associates or employees, This is hardly desirable, since he will not know whether their work is good or bad. And he may go broke before he finds out.

While it is true that officers in manufacturing or process organizations are not expected to step into the shoes of a trained factory manager, it must be remembered that these are large organizations where functions can be compartmentalized. For most contracting organizations, the contractor himself is the equivalent of the factory manager.

Adaptation of methods

All these staff functions are only supplementary to "planning and production". The initial step in "methods preplanning" takes place at the estimator level. Every estimator, in order to price labor, must visualize the completed work and determine the method to be used on the job. If concrete is to be mixed and placed, he must decide whether it should be done by hand, with a mixer and barrows or buggies, by pumping, or with concrete purchased ready-mixed. His judgment must be immediate and sure, since there is usually not enough time for process studies. Scientifically speaking, "methods preplanning" should be done in detail before the job is priced. But under present methods of bidding, this is hardly possible. If the job can be done beforehand, some of the savings of the contractor might be passed on to the client, and in the final analysis, permit more

ALL NEW DESIGN!
Simple...Foolproof...Low Cost
1500 WATT HOMELITE GENERATOR

Model 35A115
Homelite Generator
1500 Watts, 115 Volt
60 Cycle AC

As easy to move as an electric hand saw!

1. New Money-Saving features . . . No DC brushes; just two easy-to-get-at collector ring brushes . . . No commutator or DC windings . . . No intermediate couplings; armature keys directly to shaft. Fewer parts to wear out — longer trouble-free generator service.

2. Constant Voltage . . . less than 4% change from no load to full 1500 watt capacity . . . assures long service life for your electric tools . . . guarantees top performance at all times.

3. Overload Capacity . . . 1500 watt continuous duty with generous overload capacity prevents tool stalling under heavy loads . . . insures uninterrupted service even when starting loads exceed operating loads.

4. Compact and Lightweight . . . one man can easily carry this generator wherever you need electricity to power time-saving electric tools. No need for long, hazardous power-consuming cables.

Whatever tools you want to operate — electric saws, drills, floodlights, grinders, belt sanders, hammers, — the new Homelite 35A115 generator can save you money. For a free demonstration or additional information, call your nearest Homelite representative, or write:

SAVE EVEN MORE! New Homelite electronic idle control unit, available as optional accessory, runs engine at idle speed when no current is drawn . . . automatically brings engine to full speed when load is applied.
Ask your Homelite representative to show you how this easily-installed accessory reduces engine wear . . . increases service life . . . cuts fuel consumption.

HOMELITE *A DIVISION OF TEXTRON AMERICAN, INC.*
5901 RIVERDALE AVE., PORT CHESTER, N. Y.
Manufacturers of Carryable PUMPS • GENERATORS • BLOWERS • CHAIN SAWS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 271

building to be done.

Estimating is so important that the construction manager should know as much if not more about the subject than the "estimator technician". He should be ever more familiar with the indirect and overhead costs, so that he can advise the estimator. He should also be responsible for supplying the estimator with accurate cost information on past work of a similar nature. These figures can rarely be used without some alteration, but they are the best possible reference and guide. All this means that the construction manager should be a competent cost engineer, able to set up and control a practical and efficient system of costing, cost analysis, and cost controls.

Once the work has been secured and is under contract, the vital item becomes "methods preplanning"—the selection of men and machines to do each part of the work with predetermined methods, so that high efficiency and low cost can be achieved.

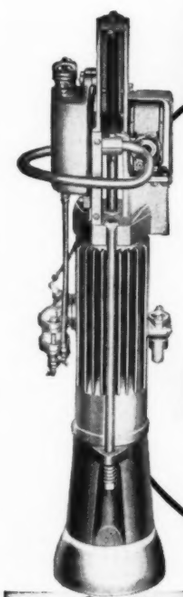
Present-day practice is to have the contractor, with or without his key men in conference, determine the basic methods and machines to be used, while leaving the details to the superintendent on the site. Such judgments may very well be wrong. It is rare to find a contractor who will not openly admit that if he had a particular job to do over again, he would do it in a different way.

Industrial management, however, does not leave this preplanning—the selection of men, machines, and methods—to snap judgment. Over the years, it has developed simple, but scientifically accurate ways of locating the best method to use for a particular operation. Preplanning is done first on paper. All possible alternate work methods are set down. Then, by a technique known as "work simplification", all but the best methods are eliminated. This is done through the use of a simple type of shorthand, composed of four or five symbols, applied to what are known as process charts. The charts are also accompanied by the required equipment layouts.

Those progressive contractors who have tried industrial production techniques on their jobs are currently reporting savings of 10 to 15 per cent on the over-all cost of work. This, I believe, is a conservative estimate. I believe too that all contractors and subcontractors are looking for the kind of results "work simplification" techniques can produce. The big problem now consists of proving to contractors that the time and money they spend to give key personnel the required training will pay off on the job.

The adaptation of industrial engineering techniques to contracting can put work on a sounder economical basis. But it is not a cure-all; it will not automatically correct uneconomical practices within an organization. A firm must have a cost system that provides information on old methods and checks new procedures. Materials must be correctly purchased, billed, and delivered according to a predetermined schedule. Manpower and

For the LOW BID on any job, figure your costs with BARCO



BARCO *Gasoline* RAMMER

BETTER BUILDING CONSTRUCTION! This job called for high degree compaction. The Barco Rammer did it at the rate of 1 to 1½ square yards per minute with 12" to 20" lifts and handled from 160 to 240 cu. yds. per 8 hour day.

SOIL COMPACTION is here to stay! *Specified Compaction* is now accepted practice on all modern construction projects. The BARCO RAMMER gives you specified compaction on these jobs at very little extra cost. Time after time, it has been proven that no other type of equipment can match BARCO PERFORMANCE:

- Better work! Easy to meet specifications calling for 95% to 97.5% (modified Proctor) compaction.
- Ideal for work in restricted areas: inside buildings, close to walls, culverts, and abutments—in trenches, ditches.
- Faster compaction! 20 to 30 cu. yds. per hour—day in and day out.
- One man operation! Completely self contained; no auxiliaries needed.
- Low operating cost. Low initial cost.
- SAFE! Simple to operate. Operators like Barco Rammers.

CUTS TRENCH COSTS! Using lifts up to 24", this Rammer finished backfill in 18" trench at a rate of 360 to 600 feet per hour for quick completion of job and no cost for additional backfill.

ASK FOR A DEMONSTRATION—See for yourself—ask for our nearest distributor to give you a demonstration. Catalog No. 621 on request.

BARCO *Manufacturing Co.*

5188 Hough St., Barrington, Ill.
A Chicago Suburb

NOW! QUICK DELIVERY FROM FACTORY STOCK!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 272

ELIMINATE THIS DANGER ZONE!

You can eliminate this danger zone under any hoist, crane, or other lifting equipment with Bullard-Burnham safety hooks. A pushbutton safety gate makes it impossible for loads to jar loose until the hook is manually unlocked, and also acts as a constant safety gauge indicating whether or not the hook is sprung. Notice that the safety gate leaves the hook's throat 100% clear. The heavy duty safety gate is non-corrosive brass with a stainless steel lock pin that will last for years.

E. D. Bullard Company, 275 Eighth St., San Francisco

Hook on load block
Hook with jaw and jaw-type bail for link chain
Hook with adapter nut for all types of pullers

Write for complete data and specifications

EVERYTHING BULLARD IN SAFETY
T. M. REG. U. S. PAT. OFF.
see our catalog in PLANT ENGINEERING FILE or write for copy

BULLARD

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machine requirements must be met and kept under control in case weather changes affect the job schedule. Every department, division, and section of the organization must operate in a standard manner. Then, with the entire organization working well, "work simplification" techniques will show their value.

The main emphasis in training men in construction management should be placed on three phases of contracting operations—production methods, estimating, and cost accounting. Training in work that is done at staff level is important, but supplementary.

(Next month's article will deal with "Contract documents—the proposal".)

HRB makes final report on WASHO road test

Test data, analyses, and findings made on the WASHO road test are contained in a final report of the test published by the Highway Research Board. Among other significant findings, this 212-page report shows that asphaltic surfacing of shoulders greatly increases the durability and load-support value of pavements, and that a 4-inch surface course proved far superior to a 2-inch surface course on pavements having the same depth.

The results of the shoulder-surfacing test support the practice of a number of states that include shoulder paving as part of highway construction standards. In addition to showing structural value, paved shoulders on the test road demonstrated that they provide increased safety for motorists.

Test sections with a 4-inch surface course also showed load-support capacities comparable to pavements 3 to 9 inches deeper, but having only a 2-inch surface course.

The WASHO road test, sponsored by the Western Association of State Highway Officials, was made to study the behavior of certain flexible pavements under the repeated application of a number of selected heavy axle loads. Traffic testing continued intermittently on specially built pavements from the summer of 1952 to May, 1954. Written by project engineer W. N. Carey, Jr., of the HRB and research engineer A. C. Benkelman of the U. S. Bureau of Public Roads, the report is priced at $3.60 and may be purchased from the HRB, 2101 Constitution Ave., Washington 25, D. C.

Report is available on engineering research

A review of engineering research and a directory of the institutions conducting the research has been issued by Engineering College Research Council of the American Society of Engineering Education. Published biennially, "Review of Current Research and Directory of Member Institutions" lists the major engineering colleges in the United States and the projects in which they are engaged.

The number of faculty members and students engaged in each project is also tallied along with the amount of money spent on each project.

Copies of the handbook may be obtained for $2 from Renato Contini, secretary, Engineering College Research Council, New York University, University Heights, New York 53, N. Y.

Wire rope slings

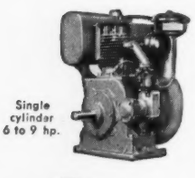
■ Union Wire Rope Corp. offers a 60-page catalog on its line of Tuffy slings. Charts and diagrams describe 16 different factory-fitted slings and nearly two dozen standard fittings. The catalog also contains a riggers manual, a shop chart of proof-tested ratings for all Tuffy slings, a notebook of specifications, and standard signals for directing the operations of overhead traveling cranes, derricks, locomotive cranes, and other rigs.

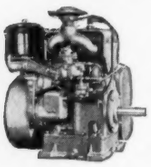
To obtain Catalog SL-No. 2 write to Union Wire Rope Corp., 2100 Manchester Ave., Kansas City, Mo., or use the Request Card at page 18. Circle No. 495.

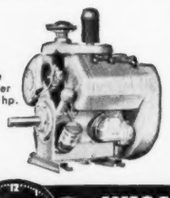
Drive carefully—the life you save may be your own.

WISCONSIN HEAVY-DUTY Air-Cooled ENGINES

Single cylinder 2.3 to 6.8 hp.


Single cylinder 6 to 9 hp.


2-cylinder 7 to 15 hp.


V-type 4-cylinder 15 to 36 hp.

Offer the Most Complete Power Selectivity to Fit the Job and the Machine

Because Wisconsin Air-Cooled Engines are supplied in a complete power range, from 3 to 36 hp., in 4-cycle single cylinder, 2- and 4-cylinder types and sizes, there is an ideal size to fit a great variety of construction equipment applications, with maximum power advantage, greatest economy and low-cost maintenance.

Every Wisconsin Engine, from the smallest to the largest, is of heavy-duty design and construction, with the built-in Lugging Power that hangs on through the shock-load pinches as well as standing up under continuous, constant load service.

All models are equipped with tapered roller bearings at BOTH ends of the crankshaft, taking up both radial- and end-thrusts — permitting safe mounting of drive pulley, gear or sprocket directly on the extended crankshaft, with utmost protection against bearing failure.

All models are furnished with rotary type, high tension OUTSIDE Magneto, with Impulse Coupling for quick easy starts in any weather, at low cranking speeds.

All models have pump-circulated, positive lubrication systems and foolproof AIR-COOLING at its best.

You can't do better than to specify "WISCONSIN POWER" for your equipment.

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

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ON-TIME MAINTENANCE REDUCES DOWN TIME EXPENSE

HOBBS HOUR METERS tell you at a glance when protective maintenance is due — the essential services that lengthen the life of your equipment and reduce repairs.

Not a Revolution Counter

The HOBBS HOUR METER is an electric timing instrument that shows HOURS and MINUTES of engine operation — important accuracy that no revolution counter can provide. It records running time on all types of powered equipment — stationary or mobile . . . gasoline or Diesel.

Approved by Leading Manufacturers

Installed as original equipment or recommended as an approved accessory by leading construction equipment manufacturers. Ruggedly built . . . easy to install. See your factory branch, representative or distributor . . . or WRITE:

HOBBS Engine Hour METERS

Pointer type illustrated; now available also in direct-reading models.

John W. Hobbs Corporation
2067 YALE BLVD. SPRINGFIELD, ILLINOIS
World's Largest Builders of Running Time Meters

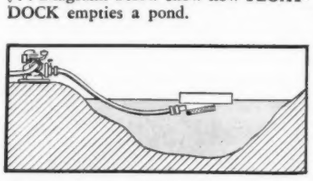
For more facts, use Reader-Reply Card opposite page 18 and circle No. 275

FOR CLEAN PUMPING IN DEEP or SHALLOW WATER -- Get a REVOLUTIONARY NEW

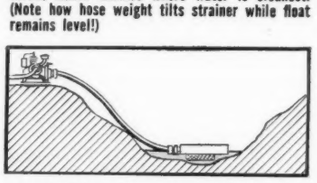
FLOAT-DOCK

IT FLOATS ... above sand and muck--below scum and debris!

No more whirlpools or loss of suction! No more sand and gravel entering your pumps, wearing out impellers, packing, and bearings! Hinged strainer is quickly detached for pumping from vertical water sources such as cisterns, etc. Constructed of heavy, cadmium-plated steel . . . Diagrams below show how FLOAT-DOCK empties a pond.



★ **DEEP DRAFT — Strainer drafts at a few inches below surface where water is cleanest. (Note how hose weight tilts strainer while float remains level!)**



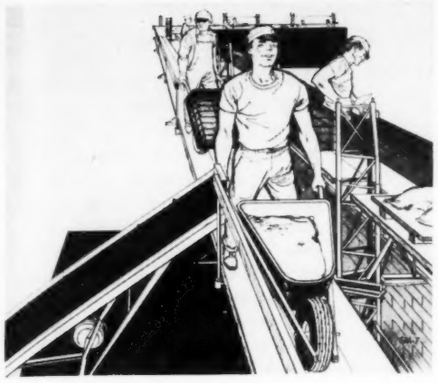
★ **SHALLOW DRAFT — FLOAT-DOCK drafts down to about 5 inches depth and still no whirlpool or loss of suction!**

SEND for COMPLETE INFORMATION

Write your distributor or send direct to manufacturer for low prices and descriptive folder on FLOAT-DOCK. Be sure to give hose size.

Manufactured Only By
FOL-DA-TANK COMPANY
Box 361, Rock Island, Illinois

For more facts, circle No. 276



Morgen adjustable scaffolding now features an extension of the laborer's platform for wheelbarrows, carts, and other material-handling units.

Adjustable scaffolding with new improvements

■ The Morgen Mfg. Co., Yankton, S. Dak., has announced two major construction changes in its adjustable masonry scaffolding.

One change involves a greatly increased load rating for the basic 10-foot tower and the tower extensions. Whereas the towers were formerly built to hold loads up to 2½ tons, they are now being built to maintain loads almost double that figure. The second improvement is in the form of a new extension for the laborer's platform to accommodate mechanized material-handling equipment, such as carts, wheelbarrows, and other units working from conveyors, lifts, or hoists.

According to the manufacturer, Morgen adjustable scaffolding requires only one setting up; there is no lost time for rescaffolding; and the mason or other worker is kept at his most efficient working level at all times. One setup provides scaffolding for the construction of up to 23 feet of wall.

For further information write to the company, or use the Request Card at page 18. Circle No. 143.

Guide to V-belt drives

■ More than 50 multicolored tables designed to simplify selection of its Texrope constant-speed V-belt drives are contained in a booklet available from Allis-Chalmers Mfg. Co. In addition to providing selection tables for A, B, C, D, and E-section Texrope belts, the handbook features information on design features, basic drive principles, and operation.

To obtain Tex-Book 20P40 write to the Allis-Chalmers Mfg. Co., 951 S. 70th St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 186.

Electric melting pot

■ Details on a portable electric melting pot for asphalts, tars, pitches, resins, mastics, and other viscous materials are found in a mailing piece from Glas-Col Apparatus Co. The model features thermostatic control. Typical applications and the construction of the pot are detailed.

To obtain Bulletin 202 write to Glas-Col Apparatus Co., 711 Hulman St., Terre Haute, Ind., or use the Request Card at page 18. Circle No. 174.

NEWEST PAYLOADER® MODEL
sets the pace for a bomber base

Here is the starting point of Peter Kiewit Sons "production line" for concrete placing at a large bomber base — a Hough model HH "PAYLOADER" tractor-shovel feeding a belt conveyor with sand and gravel from adjoining stockpiles. The task of the "PAYLOADER" is a crucial one, because failure at this point would bring the entire concrete-placing operation to a standstill.

Peter Kiewit Sons, one of the largest and most progressive of heavy contractors, have been using "PAYLOADER" tractor-shovels for years on their contracts all over the United States. You too, can depend on the proven performance of "PAYLOADER" tractor-shovels and on the large and reliable Distributor organization that sells and services them, both at home and abroad.

This model HH is one of three completely-new 4-wheel-drive "PAYLOADER" tractor-shovels. They all have a sensational new kind of bucket arm design that provides 40 degrees of bucket tip-back at ground level, powerful pry-out action plus unusual safety, stability and visibility factors.

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Send data on new 4-wheel drive units
☐ Model HU—1 cu. yd.
☐ Model HH—1½ cu. yd.
☐ Model HO—2 cu. yd.
☐ Smaller "PAYLOADER" units

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Title_____
Company_____
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PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

For more facts, use Coupon, or Reader-Reply Card opposite page 18 and circle No. 277

Better work with high-pressure hose

Limited elongation and bending does no damage; special coupling secures hose carrying slurries

by J. A. MULLER, executive engineer,
Thermoid Co., Trenton, N. J.

The introduction of multipurpose types of hose by several manufacturers a few years ago did much to lighten the work of construction engineers who depended on hose for carrying air, water, and steam at common pressures and temperatures. Our own company also helped simplify problems when it brought out a line of five basic hose, replacing 18 separate hose formerly used on about 90 per cent of all work.

Problems remain for those who work with special types of hose carrying new or standard materials at pressures and temperatures higher than normal. Yet even these can be easily overcome. Two advances—relating to bending radius and charge under pressure—have been made in high pressure hose.

Modern hose can safely be bent in a radius of one foot for every inch of inside diameter. Bending is important in many instances, particularly in the remote control of such equipment as bulldozer blades, where hose must conduct fluid at high pressure to actuate assemblies. This is relatively simple, and the hose can be designed with enough reinforcement to withstand pressures up to 4,500 psi. But the hose is also connected to parts which move, and has to be made to withstand high pressure yet have a workable bending radius. Space available in automatic machines is extremely limited, so that large loops of hose cannot be tolerated.

Another important factor to consider in using hydraulic hose is the per cent charge in length under pressure. Hose manufacturers publish per cent length charge figures, and users may consult these figures to allow for length charge under pressure. Braided hose will contract or expand under pressure, depending on the grade. Spirally wound mandrel-built hose will elongate. However, modern hose is so made that expansion and contraction can be controlled, or limited to small amounts.

Integral couplings

Hose used to convey liquids and slurries at high pressure is larger than hydraulic hose, and may range up to 6 inches in inside diameter. Burst resistance of this type of hose is taken care of by spirally wrapped steel cables. But a big problem is preventing couplings from separating from the hose.

This problem can be solved with a special coupling designed for this type of hose. The ends of reinforcing steel cables are drawn through slots milled from a solid steel tube, then secured with set screws. The steel tube extends a few inches beyond the slots in both directions. The outboard end is threaded to receive the coupling cap, which helps seal off the hose tubing that extends through the slotted sections. The cap is also threaded so that it can be attached to equipment being served.

The result is an integral hose unit. The outside diameter of the hose at

←For more facts, circle No. 278

PROOF OF LIMA QUALITY

These 29 Limas at The Union Building & Construction Corp. illustrate Lima's ability to furnish a machine designed to fit every job requirement; 7 Type 34-T, 20 ton truck cranes; 1 Type 44-T, 25 ton truck crane; 2 Type 3¼, ¼ yd. crawler clamshells; 3 Type 44, 1 yd. crawler shovels; 3 Type 703, 1¼ yd. crane-dragline-pullshovel combinations; 1 Type 703SC special crane; 2 Type 802, 2 yd. crawler shovels; 3 Type 803, 2½ yd. shovels; 4 Type 1201, 3½ yd. shovel-crane combinations; 3 Type 1601, 4 yd. shovel-dragline combinations.

The Union Building & Construction Corp. . . .

Relies on fleet of 29 LIMAs for their many diversified jobs

The 29 Limas operated by The Union Building & Construction Corp., Passaic, N. J., are clear evidence of their reliance on Lima quality. Year-after-year, they've added to their fleet of these quality-built machines. Why? Because each of their Limas continues to give them top performance and operating economy on every digging and lifting job . . . without frequent, costly maintenance. That's how Lima quality builds profits for Lima users.

Across the country and around the world, firms like The Union Building & Construction Corp. rely on Limas for profit-making performance. It will pay *you* to contact your nearby Lima distributor for complete details on these quality-built machines . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

COMPARE QUALITY! No other machine gives you as much as LIMA!

1. Moving parts are flame or induction hardened for longer life.
2. Main machinery is placed well back of center of rotation.
3. Anti-friction bearings at all important bearing points.
4. Big capacity drums and sheaves are easy on cables.
5. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
6. Torque converter (optional).
7. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts.

COMPARE and you'll specify LIMA for shovels (to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division • LIMA • OHIO • U. S. A.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

the coupling is only slightly larger than the outside diameter of the hose itself. And the slight increase in diameter is achieved gradually and smoothly. There are no ridges, flanges, bulges, or sharp changes in diameter.

Work problems with steam hose used by pile drivers has been all but eliminated by the construction of the hose itself. Steel wire braiding provides burst resistance, enabling the hose to handle saturated steam at 385 degrees F at 200 psi without danger. Steel braiding on this hose is bonded to the couplings to protect against a build-up of static electricity. This in turn permits work to be done in areas where flammable liquids are present. One ply of asbestos around the hose serves as insulation. THE END

Concrete vibrators

■ A folder describing the Hi-Lectric line of concrete-paving vibrators is available from the Maginniss Power Tool Co. These 180-cycle units, featuring motor-in-head construction, are illustrated by means of photographs and drawings. Details are given on the Hi-Lectric side-form vibrator attachment, the pavement-widening attachment, and the full-slab attachment, as well as on Hi-Lectric multi-purpose generators.

To obtain this folder write to Maginniss Power Tool Co., 154 Distl Ave., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 151.

Mobile ac generators

■ Technical and application data on mobile ac generators is illustrated in a brochure from Star-Kimble Motor Division of Miehle Printing Press & Mfg. Co. These MO-BIL-AC units, the alternator and regulator, supply up to 10 kw at standard voltages and frequency, according to the manufacturer. The equipment is recommended for use in auxiliary lighting and for driving power tools and machinery in locations away from power lines or during power failures.

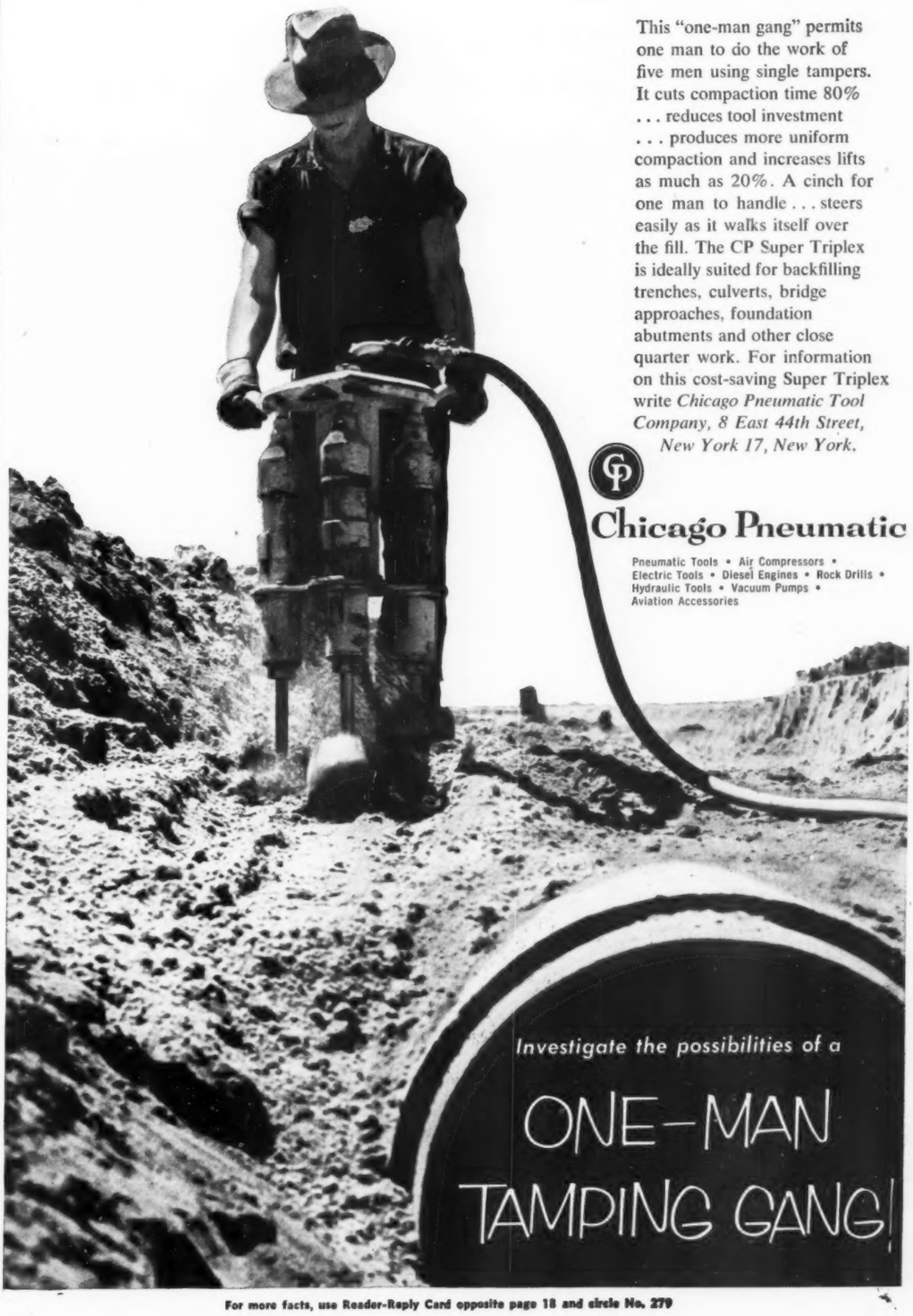
To obtain this brochure write to Star-Kimble Motor Division of Miehle Printing Press & Mfg. Co., 200 Bloomfield Ave., Bloomfield, N. J., or use the Request Card at page 18. Circle No. 190.

Bitumuls and their uses

■ On-the-job photos illustrate the uses of American Bitumuls emulsified asphalt for rapid mixing with a full range of economical aggregates. The bulletin describes briefly the asphalt used in pavement construction throughout the country. The preparation of asphalt pavements by means of blade grader, rotary tiller, traveling mix plant, central plant pugmill, and rotary drum mixer is described.

To obtain this bulletin write to the American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 11, Calif., or use the Request Card at page 18. Circle No. 182.

DELIVERING A FULL-CAPACITY 9,000 GPH, this new Homelite self-priming centrifugal pump does an unwatering job on a section of the New York Thruway just north of New York City. A special feature of the new Model 36S2 pump is a carburetor which may be throttled down, yet permits high-capacity operation with little noise. This feature makes the new pump an ideal unit for use in residential areas, especially when nighttime pumping is required. For further information write to Homelite, 71 Riverdale Ave., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 71.

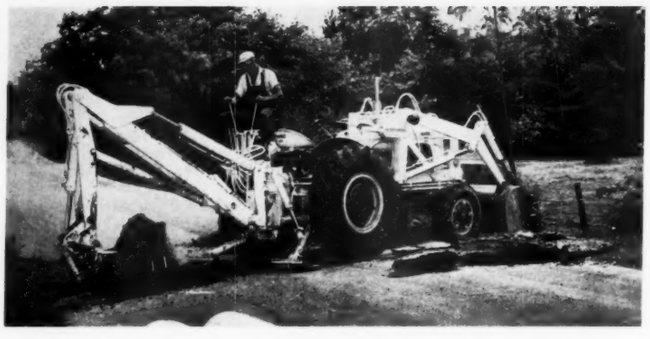


This "one-man gang" permits one man to do the work of five men using single tampers. It cuts compaction time 80% . . . reduces tool investment . . . produces more uniform compaction and increases lifts as much as 20%. A cinch for one man to handle . . . steers easily as it walks itself over the fill. The CP Super Triplex is ideally suited for backfilling trenches, culverts, bridge approaches, foundation abutments and other close quarter work. For information on this cost-saving Super Triplex write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

Chicago Pneumatic

Pneumatic Tools • Air Compressors • Electric Tools • Diesel Engines • Rock Drills • Hydraulic Tools • Vacuum Pumps • Aviation Accessories

For more facts, use Reader-Reply Card opposite page 18 and circle No. 279



Mounted on a Case 420 tractor, the new Ottawa backhoe and front-end loader work on a pipe trench across a blacktop road.

Backhoe and loader for small tractors

■ The Ottawa industrial front-end loader and backhoe are now being manufactured for the new Case 420 and 425 tractors, according to an announcement by the Ottawa Steel Division of the L. A. Young Spring & Wire Corp.

The Ottawa backhoe is available in two models for each tractor. One model digs 8½ feet deep, the other 11 feet deep. Both feature a hydraulically actuated bucket which makes it possible to retain the material while loading into trucks over 8½ feet in height. The backhoe is equipped with new, wider outriggers which increase in width as down pressure is applied, giving greater stability under adverse digging conditions, and revert to minimum width when in traveling position for better roadability.

The Ottawa loader is equipped with four double-acting hydraulic cylinders: two to raise, lower, hold, and provide down pressure on the bucket; and two to dump and retract the bucket. A feature contributing to the powerful breakout action of this loader is the 18-degree tilt-back action possible with the bucket. This feature also makes it possible to carry greater payloads without spilling.

Both attachments feature single-lever control of bucket and boom movement.

For further information write to Ottawa Steel, P. O. Box 39, Ottawa, Kans., or use the Request Card at page 18. Circle No. 148.

Pipe or cable indicator has improved features

■ Further improvements in its Line Locator are announced by the Wilkinson Products Co. Chief among these is reduced variation between one set and another, the result of advanced automation methods in manufacturing, which permits the transmitter of one instrument to be interchanged with the receiver of another.

Advantages of this new feature are to be found in cases where a large contractor is using a number of these instruments. Servicing of the instruments is said to be easier, too, because of the automatic method of fabrication.

Instrument cases are reported to be more resistant to wear because of their construction of a sturdy phenolic material with a tensile strength of 7,000 pounds per square inch. Maximum moisture absorption is said to be only one per cent. Weight of the instrument is 10 pounds.

The Wilkinson Line Locator is recommended for pipeline work and other construction operations where precision location of subsurface pipes, cables, and other underground installations is necessary. The instrument is especially recommended for use where frozen ground or ice present difficult digging conditions.

For further information write to the Wilkinson Products Co., 3987 Chevy Chase Drive, Pasadena, Calif., or use the Request Card at page 18. Circle No. 176.

Paving spreader

■ The mechanical features, uses, and complete specifications of the Jersey Spreader are found in a folder from the manufacturer, Tractor Spreader Co., Hasbrouck Heights, N. J. Front, side, and end views and action shots of the spreader are included.

To obtain this folder write to the company, or use the Request Card at page 18. Circle No. 171.

Pioneer buys property of Minneapolis-Moline

The Como Avenue plant of the Minneapolis-Moline Power Implement Co., Minneapolis, Minn., has been purchased by the Pioneer Engineering Works, Inc., also of Minneapolis. The acquisition will enable Pioneer to consolidate operations that are now being carried on in four locations in the city, and will provide land for future expansion.

How high load capacity is built into less space in Dodge-TIMKEN All-Steel pillow block

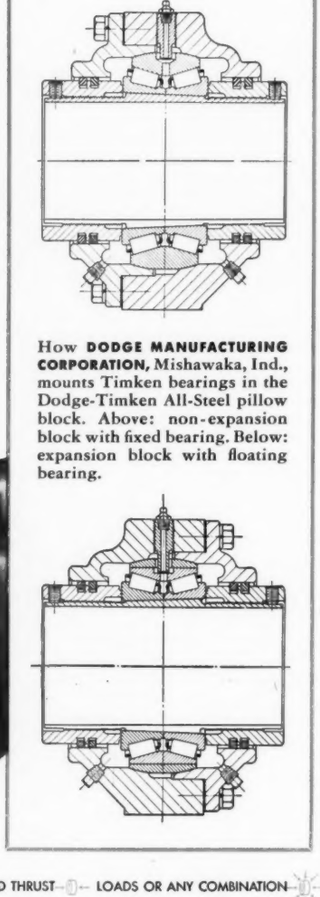
THIS rugged Dodge-Timken pillow block packs more capacity in less space than ever before. All-steel construction gives it extra strength and durability. The design is compact. No special thrust devices that take up extra space are needed—the two-row Timken® tapered roller bearing takes *both* radial and thrust loads in any combination. And full line contact between the rollers and races assures high load capacity.

The cutaway view below shows the bearing. It is of special design, with tapered bore and self-aligning spherical outer surface—never requires adjustment. As in all Timken bearings, races and rollers are case-carburized and have tough, shock-resistant cores under hard, wear-resistant surfaces. Under normal conditions, the Timken bearing will last the life of the machinery with which the pillow block is used.

In addition to the all-steel pillow block shown here, Timken bearings are also used in the Type "E", Double-Interlock, Type "C", and Special-Duty pillow blocks—other versatile pillow blocks in the Dodge-Timken line with a wide variety of uses in industry.

To be sure of the finest bearing steel, we make our own—America's only bearing manufacturer that does. No other bearings can give you all the advantages you get with Timken bearings. Include them in your design plans...specify them for the machines you buy or build. Look for the trademark "Timken"—it's on the bearing that makes any machine run better. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **DODGE MANUFACTURING CORPORATION,** Mishawaka, Ind., mounts Timken bearings in the Dodge-Timken All-Steel pillow block. Above: non-expansion block with fixed bearing. Below: expansion block with floating bearing.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST ▯ LOADS OR ANY COMBINATION ✳

For more facts, use Reader-Reply Card opposite page 18 and circle No. 280

The Casteel WB3 wheel block.

Lightweight wheel block gives heavy-duty service

■ A newly designed wheel block for trucks, trailers, and other heavy machinery is manufactured by Calumet Steel Castings Corp. The new safety device is a special alloy-steel casting said to combine great strength with light weight and compact size.

The design of the Casteel WB3 wheel block affords stiffening members at the rear corners which also serve as convenient handles. A curved face provides maximum contact with the tire, and even distribution of the load. The large flat base reportedly gives maximum support in soft footing, while the integrally cast gripper teeth at the rear edge provide holding power on ice or snow.

The block is also available with removable alloy-steel heat-treated gripper teeth or calks to facilitate the replacement of worn teeth, and for use without teeth on any soft paving.

The block measures 7×9×9 inches and weighs only 12 pounds. It is easy to move and set up.

For further information write to Calumet Steel Castings Corp., 1610 Summer St., Hammond, Ind., or use the Request Card at page 18. Circle No. 154.

Joint-sealing compound for jet base runways

■ A new joint-sealing product for use around concrete paved airports, refineries, bulk plants, and other areas subjected to the deteriorating effects of petroleum derivatives has been announced by Keystone Asphalt Products Co. Called Jetseal joint sealer, this nonasphaltic compound is said to be highly resistant to jet fuel and engine-cleaning compounds.

According to the manufacturer, Jetseal joint sealer offers lasting protection against damage caused by the infiltration of water and other foreign substances, and maintains positive bond with the concrete throughout complete cycles of extreme cold and heat.

The sealer is supplied in plastic-lined 5-gallon steel pails designed to permit fast, easy removal of the compound. These pails reportedly offer greater ease of handling and eliminate loss caused by package failure.

For further information write to Keystone Asphalt Products Co., Division of American-Marietta Co., 101 E. Ontario St., Chicago 11, Ill., or use the Request Card at page 18. Circle No. 177.

Portable storage unit for contractor's tools

■ A portable shelter for contractors' equipment and tools is offered by the Pennington Mfg. Co. Called the Hideaway, the 8×10-foot structure is easily and quickly erected at a job site.

The shelter consists of 12-gage angle-iron framing with steel walls and roof and a marine plywood door. A wood floor is optional. The parts are shipped in four bundles, and 6 manhours, a screwdriver, and a wrench are all that is required to erect the building, according to the manufacturer.

The Hideaway is said to be fire-resistant and will not rot or warp.

For further information write to Pennington Mfg. Co., 190 Commercial Road, Addison, Ill., or use the Request Card at page 18. Circle No. 147.

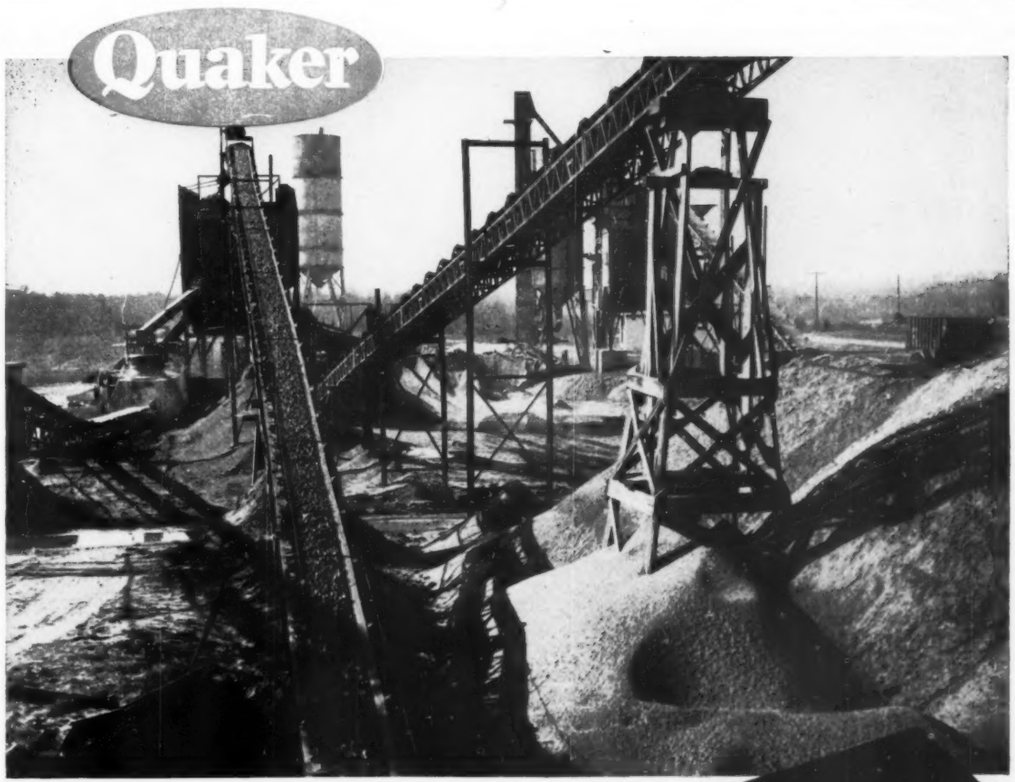
Folder on water batcher

■ A bulletin describing a new semi-automatic water batcher for use in concrete batching plants is available from The Heltzel Steel Form & Iron Co. The literature explains how the new Heltzel water batcher enables the plant operator to discharge the exact amount of water specified, either in pounds or gallons—even compensating for "mid-air" water. The folder also claims that the batcher's simplified construction assures a minimum of maintenance.

To obtain Bulletin K-18 write to The Heltzel Steel Form & Iron Co., Warren, Ohio, or use the Request Card at page 18. Circle No. 161.

Van Brush appoints

Robert C. Chenoweth has joined the Van Brush Mfg. Co., Inc., Kansas City, Mo., as factory representative. He will handle over 1,000 items in the industrial brush and broom market.



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No matter what you consider most important in a conveyor belt, there is a Quaker-Quaker Pioneer belt constructed to meet your need. This one, for instance, is especially made for tough shock resistance. Highly flexible, it is strong cotton duck, with average cover tensile strength 2500 to 3000 lbs. Skim coat between plies. For jobs requiring even greater troughability, tension resistance and flexing, Quaker can supply belts of new high tensile strength rayon or cotton-nylon fabrics of any desired cover thickness. Complete line offers industrial rubber products including hose, packing and moulded rubber for every use.

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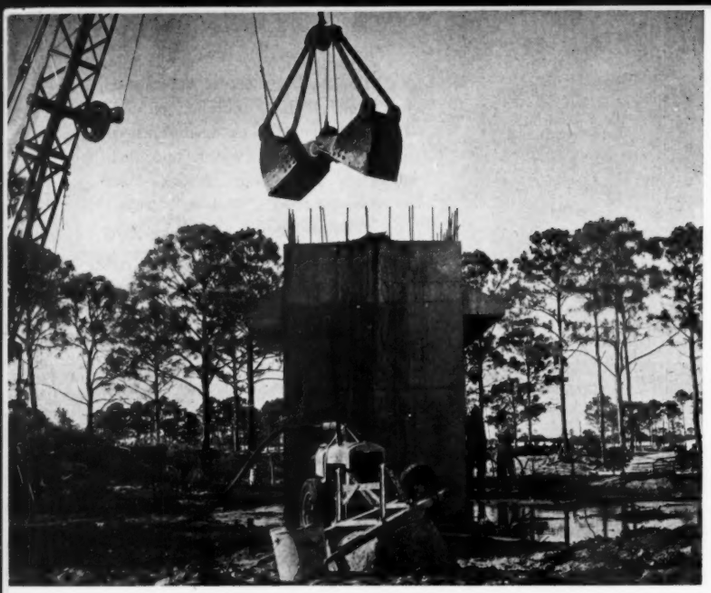


An Owen ½-yard clamshell works in the narrow confines of the tank being sunk, while a 4-inch centrifugal pump maintains the proper head pressure in the structure. The concrete shoulders of the structure will rest on prepared rock bed to keep the tank on a level grade.

Subsurface water is a problem, so . . .

Contractor builds lift station

Working on a sewage-collection system and treatment plant in Lyons Park, Fla., utilities contractor Bates & Dungey, Pompano Beach, ran into a problem which has long plagued contractors in certain sections of Florida's booming southeast coast. When attempting to dewater and excavate for lift stations, the firm ran into a seemingly endless supply of subsurface water.

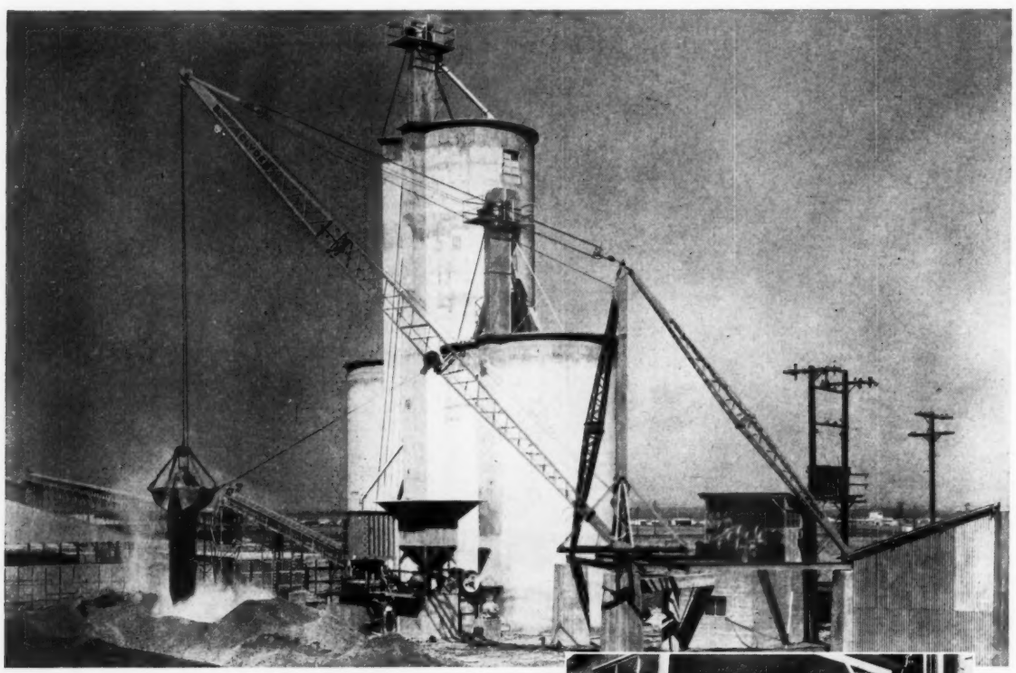
Finding wellpoints ineffective below a 10-foot depth, due to heavy muck concentrations and rock strata, Bates & Dungey decided to build the required two stations on the ground, and then sink them. This method, considered very risky not too long ago, has now gained wide acceptance.

Each station was constructed with an extra 4 feet at the bottom, so that they were 25 feet high. The regular 9-inch wall called for in the specifications was increased to a thickness of 12 inches through the extra 4 feet at the bottom, and a cutting edge was poured at the bottom of the station so that it had a 45-degree inward slope. Since no horizontal bracing could be used in the tank, the entire structure was built with high-strength 5,000-pound concrete.

The interiors of the double-section tanks barely permitted a half-yard clamshell bucket to be opened, so steel-bottom dowels were bent vertically and waffled into the sides of the structure. Previous experience had shown that the dowels would be wrenched out during clamming operations unless they were countersunk; to prevent dowels from being lost at motor slab level, threaded inserts were substituted for the dowels during pouring operations. After concrete had set, these were removed, then replaced when the motor slab was poured.

To prevent the structure from settling during pouring operations, the structure was cast on wooden mats which were dug out by hand when sinking operations started. Hand digging started the tank on its way down, and when it had been lowered 2 feet, its interior was flooded to prevent any sudden crumbling of the excavation and to permit a check to be made for wall leaks.

At this point, a three-way telephonic system, which included lip microphones and headsets, was pressed into operation by the crane operator, transit man, and tank watch, who guided the bucket into the proper position. Levels, plumb bobs, and transit were used to keep the tank level as it went down.



Faster, Safer Cycling—Easier Spotting!
Perfect visibility, easy-to-handle controls and built in safety features give the operator effortless command of a Clyde hoist and derrick.

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When you need equipment that can operate over a large radius, in congested quarters, or when mobility is essential . . . make Clyde Whirleys your materials handling choice. Compact, self-contained and full-revolving, these powerful and versatile units can be self-propelled, mounted on traveling track wheels or gantry towers, or installed on permanent foundations.

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Clyde capstan and drum type car pullers and barge movers facilitate loading, unloading or re-handling operations at loading stations. Units are safety engineered and quality constructed to give long-life, trouble-free operation.

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ONE OF THE 16 INTEGRATED COMPANIES BARIUM STEEL CORPORATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 282

With a Jaeger concrete batch truck in position over the tremie hopper, a diver equipped with a rubber suit, frogman helmet, and twin-tank Divair rigs, prepares to go under 23 feet of water to direct the placement of concrete through elephant trunks for the tank bottom.

...en sinks it into position

Experience had shown that an extreme artesian effect would be encountered below a depth of 10 feet, so the contractor maintained a positive head in the tank at all times to prevent sand and muck from washing into the structure.

When underground obstructions halted the descent of the structure several times, company general manager R. C. Reilly, and foreman Angus Tindall went to the bottom with self-contained diving gear to see just what the obstructions were and to determine how they could best be removed. Once, it was necessary to lower air hammers through 13 feet of pitch-black water to break up a hard boulder lodged under one corner.

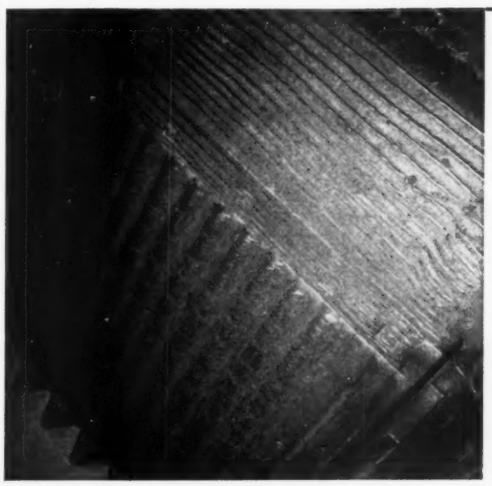
Work under water

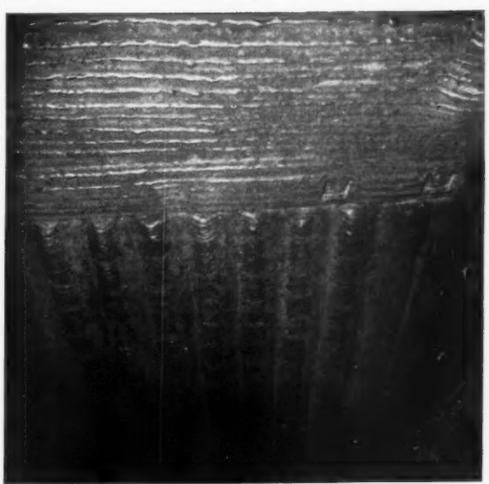
After about ten days of clamming operations, the contractor brought the structures into position, level and on grade. Two concrete shoulders running the full length of each side of the top of the tank came to rest on prepared rock beds, further insuring that the tank would stop its descent and remain level. This had been planned since the contractor could not count on a friction effect in the soft soil.

Once the tanks were sunk and in position, their bottoms were poured through elephant trunks. It was necessary to have a perfectly placed bottom to withstand extreme external pressure, so Reilly and Tindall, wearing full-length rubber suits and frogman helmets with their twin-tank Divair rigs, alternated at staying on the bottom under 23 feet of water during an entire pour. In this way, they manipulated the elephant trunk so that concrete was directed well under the cutting edge of the structure and into the corners. The divers also maintained a 6-inch separation between the trunk bottom and the concrete at all times to prevent extreme washout. During all tremie operations, Maule Industries, which provided the special 8-bag, 5½-gallon-per-bag mix, maintained a representative at the site to coordinate concrete deliveries.

After 18 inches of concrete had been poured on the bottom, divers halted operations long enough to guide a pre-tied steel mat into place and bend dowels into a horizontal position. Then an additional 18 inches of concrete was poured.

Four feet of positive head was maintained at all times during the three weeks of curing. Then the tank was pumped out, about 10 inches of washout concrete spaded off, and a 1-foot-thick floor was placed. No leakage occurred and the contractor was able to complete the tanks with conventional methods. THE END





how to EXTEND working life of jaw crushers

apply VICTOR HARDFACING

No Disassembly This jaw crusher was hardfaced with jaws bolted in place, using 3/16" coated Tube Victorite. Despite cramped working area only 12" deep and 36" wide, high deposition rate and low spatter loss enabled welder to get uniform, non-sagging, long-wearing bead without distorting jaw.

Downtime Saver Because it goes on fast, without flux interference, and sets up quickly, coated Tube Victorite is wonderful for hardfacing on the job without disassembly of equipment.

Where To Use Coated Tube Victorite is a high alloy content rod with Rockwell C hardness of 55-58. It was developed specifically for tools subject to severe abrasion and impact, such as:

- Ripper Teeth
- Pug Mill Augers
- Jaw Crushers
- Roll Crushers
- Die Rings
- Tool Joints
- Scraper Blades
- Asphalt Mixer Paddle Shanks
- Mill Hammers
- Bucket Lips

It welds easily to carbon alloy and manganese steels—the latter frequently is used for buildup before applying coated Tube Victorite. It can be used for position welding. Deposit is smooth, even, free of pin holes. Made for AC and DC (reverse polarity) application.

Free Help—Victor hardfacing manual shows you the right rod to use and how to apply it. Ask your Victor dealer for manual and descriptive leaflets on Tube Victorite and other Victor rods . . . or write us.

Profitable dealerships open; inquire now!

VICTOR for hardfacing

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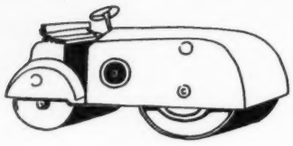

Roads and highways: Compaction of fills

Fills are made to bring a road or area up to a desired grade, to elevate it above water or drifting snow, to bury stumps or rocks, or to add strength to ground too unstable to support road surface or traffic.

Fill may be obtained by the removal of high spots or banks along the same road or project; by digging gutters or ditches alongside or near the fill; or by hauling from necessary excavation on other jobs, from commercial pits, or from borrow pits opened just to obtain the fill.

Any type of mineral earth or rock can be used as road fill, but clay and silt are generally undesirable. They soften when wet, frequently with changes in volume, and may act as a wick to bring ground water to the surface. Humus is avoided, particularly in its pure state, because of lack of bearing strength and excessive water absorption. Topsoil, a mixture of mineral soil and humus, may or may not be permissible, depending on its qualities and its location in the fill.

Sand and loose clean gravel have excellent bearing power but afford poor traction, are hard to compact, and must be held in by other materials.

The most desirable fills are mixtures of two or more simple types. Varying proportions of clay, silt, sand, gravel, and stones are found in loams, boulder clay, and glacial till. Sand and gravel are most desirable when mixed with enough clay or silt to bind them together.

Light soils with a high percentage of sand or gravel are desirable when work must be done in rainy places or seasons. They absorb and drain off large quantities of water, and do not get slippery easily.

Moisture content

The water content of soils largely determines their behavior on a fill. Each soil has a best (optimum) water content which favors compaction. Less water will allow the grains too free motion in relation to each other, and more will permit soil to bend or creep away from pressure.

A soil which contains too much moisture will develop a rubbery quality. It will move away from the roller, and when its weight has passed, spring back into nearly its original position.

A loose soil may hold too much moisture for best compaction and still appear fairly dry. When the grains are squeezed together, water films between them are displaced and tend to work up toward the surface, rendering it wet. This condition may be cumulative through a number of layers of fill.

Undisturbed soil has generally been in the same position for long periods. The particles are well settled against each other, leaving little space. Natural cements may bind them together.

When such a soil is dug or disturbed, it breaks up into chunks or grains which are thrown against each other in a disorderly arrangement, leaving air spaces or voids between. This increases the bulk of the soil, and increases its ability to absorb and conduct water. Such a loosened soil will turn to a very soft mud if soaked.

The process of soaking and then drying will settle the grains together somewhat, reducing the voids. Repeated wetting and drying will cause it to shrink to about its original bulk. Freezing and thawing will accelerate this settlement, as will also the weight of traffic or additional fill.

Considerable packing down of fill

American Explosives and Blasting Supplies Clear the Way for America's Superhighways!

Here's the Breakdown

Highway	No. of Contractors Supplied	Time	Types of Rock	American Explosives Used
Pennsylvania Turnpike	5	1939-40	hard limestone, shale, limestone, traprock, sand rock	40%, 60% ammonia and gelatin dynamites
Philadelphia Extension Turnpike	5	1949-50	hard limestone, shale, limestone, traprock, sand rock	40%, 60% ammonia and gelatin dynamites
Western Pennsylvania Extension	3	1951	hard limestone, shale, limestone, and sand rock	40%, 60% ammonia and gelatin dynamites
West Virginia Turnpike	4	1953-54	shale and sandstone, hard, medium, soft	40% ammonia and gelatin plus semi-gels
New York Thruway	8	1953-55	hard to soft limestone, gneiss rock, traprock, hard shale	40%, 60%, 75% standard gelatin and semi-gel
Ohio Turnpike	2	1953-55	shale and limestone	40% standard gelatin
Kentucky Turnpike	2	1954-55	limestone	semi-gel
Northeastern Pennsylvania Extension	5	1954-55	sandstone and limestone	semi-gel and 40% gelatin
Palisades Parkway	3	1954-55	granite and traprock	semi-gel and 60% gelatin
Maine Turnpike	4	1954-55	granite	semi-gel and gelatin
Massachusetts Turnpike	3	1954-55	traprock, limestone and metamorphosed shist	semi-gel and 40% gelatin

The spread of superhighways over every type of terrain presents a wide variety of construction problems. Leading contractors on major expressways, and quarry operators who supply stone for the right of way, rely on American Explosives for safe, economical handling, good breakage, and dependable results with every shot.

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High Explosives
Permissibles
Blasting Powder
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Electric Blasting Caps
Instantaneous
Regular Delay
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Sales Offices: New York City, Latrobe, Pa., Pottsville, Pa., Scranton, Pa., St. Louis, Mo., Bluefield, W. Va.

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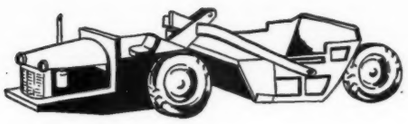


This is the tenth in a series of articles consisting of selected excerpts from the 1,280-page book, "Moving the Earth," by Herbert L. Nichols, Jr., published last March. Priced at $15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at $15 plus postage.

can be done by hauling and grading equipment. Ground pressure under loaded scraper tires may be 30 to 40 psi, and the kneading effect of these tires and the vibration of crawler tracks are quite effective.

However, compaction tends to decrease with distance from the cut, as all the fill material must pass over the near portion, and only a small fraction over the far end. In addition, it is difficult—sometimes impossible—to get the operators to vary their routes enough to give systematic rolling to the full width. Routes may have to be shifted by stationing one or more men along the way to tell or signal the operators where to go, or by the use of movable obstacles.

It is usually inadvisable to have a heavily loaded unit break a new path in soft fill, and the power requirement and strain on the machine are excessive. Trail breaking should be done on the empty return trip, and loaded units then turned into those tracks.

Excessive rutting may be avoided by having a whole strip rolled by empties before using it for loads.

It is generally not convenient, and often not possible, to allow a long period for subgrade settlement. Also, it is very difficult to estimate the compaction a fill receives from traffic, or from rains, while building. This makes it impractical to finish grade with a loose fill and obtain the desired surface after settlement.

These difficulties can be avoided by compacting the fill as it is placed. Rollers of various types are used on thin layers of fill to squeeze the grains into even closer contact than they had in the bank. They are aided by the weight of grading and hauling units. Loam soils may be reduced to 90 per cent of their bank volume by thorough compaction.

A properly compacted fill should not shrink on exposure to time and weather, so that it is theoretically possible to put a permanent surface on it immediately. In addition, it has the highest bearing power possible to its particular soil type, so that wheels and tracks will not sink into it much, and speed and capacity of hauling equipment on it is increased.

Rollers

There are three principal types of rollers—smooth steel-wheel, tamping or sheepsfoot, and pneumatic-tire.

The smooth steel-wheel models are just known as rollers. They are usually self-powered. Weights range from 1½ to over 20 tons.

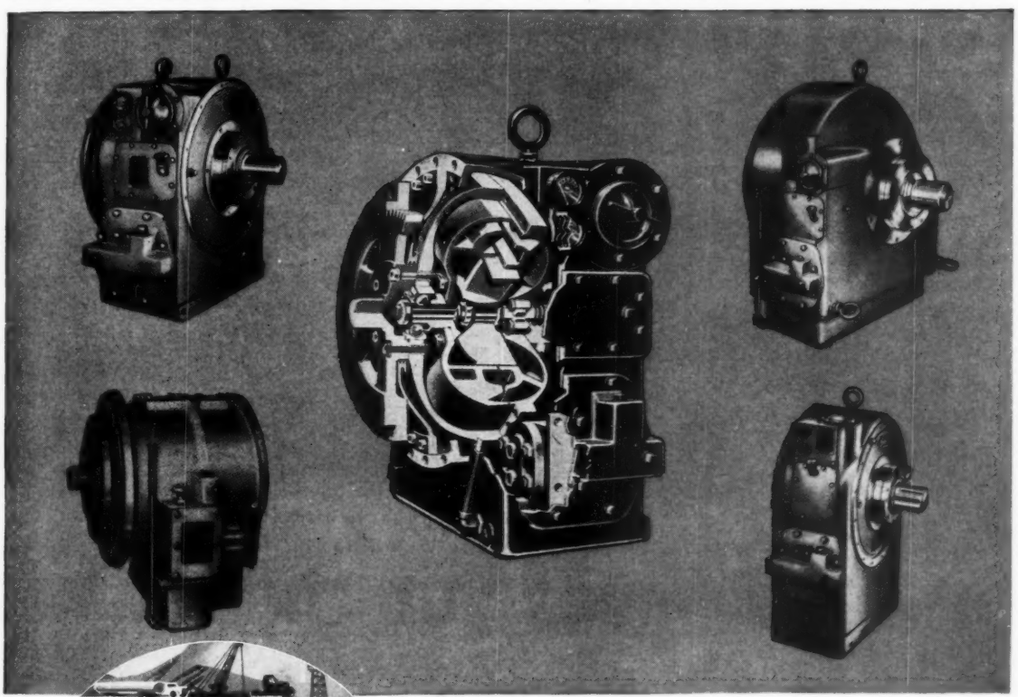
These are primarily finishing machines, and are more often used on surfaces than subgrades. They have a high compacting effect at the top, but this diminishes rapidly with depth below the roll. Each layer compacted may have a tight top and a less well packed bottom.

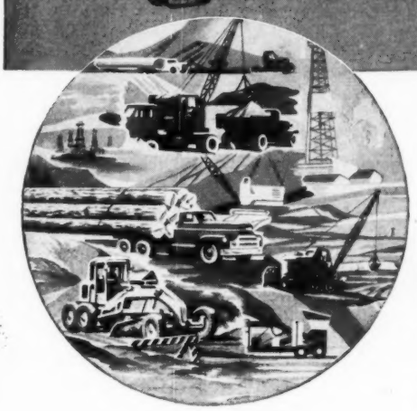
These machines have little traction, and have difficulty on rough ground or steep grades. Special grid and segmented roll surfaces improve performance on fills.

Tamping rollers are steel drums 4 to 5 feet long and 40 to 60 inches in diameter, which are fitted with legs or lugs that project about seven or more inches. Standard practice is to use three lugs to every 2 square feet of drum surface.

Legs may consist of shanks with expanded feet, or lugs of round or rectangular cross section, tapering from a wide base toward the end.

With either construction, the feet will penetrate soft fill so that a large part of the weight will be carried on





For your power need, whatever it is, there's a "right"

TORCON Model

With a horsepower range from 15 to 600, and fly-wheel diameters from 11 to 26 inches, Torcon has a model that's right for your need—a standard unit available immediately for original equipment or for field installation.

Your real benefits begin after Torcon is installed—

- **more work and less wear: Torcon blade design balances engine efficiency and horsepower through the working range—smooth, shockless power that reduces wear, prolongs life**
- **integral unit includes oil pump, sump, pressure regulator; much better efficiency with minimum maintenance**

Are you constantly on the look-out for ways to get more efficient power at less cost? Talk to Clark—on all problems of power transmission, from flywheel to point of torque application. You'll find, as do many leading equipment manufacturers, that it's "good business to do business with Clark".

SEND FOR THIS TORCON BULLETIN

—a concise, helpful statement on how Torcon installations cut operating costs, prolong equipment life.

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY, Transmission Division
Falahee Road • Jackson 7, Michigan

Other Products of the Clark Automotive Division . . . TRANSMISSIONS • AXLE HOUSINGS • TRACTOR UNITS • TORCON TORQUE CONVERTERS • ELECTRIC STEEL CASTINGS • GEARS and FORGINGS • FRONT and REAR AXLES for TRUCKS, BUSES and OFF-HIGHWAY EQUIPMENT.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 285

the sole, and compaction will begin beneath it. As the ground is compressed, the feet will not sink into it as far and the roller "walks out" of the ground.

The drums can be filled with sand or water ballast. Sole pressures range from 250 to 750 psi.

These rollers are towed by means of drawbars and box frames. Up to three may be mounted side by side, and two pairs may follow each other. Working speed is about 2.5 miles an hour, and power requirements in soft fills are heavy.

Pneumatic-tire rollers are ballast boxes supported by wheels with smooth-tread tires. The wheels may roll straight, vibrate, or move up and down or wobble as they revolve. They compact by a combination of weight and kneading action of the soft tire walls. Weights vary up to more than 80 tons. They can compact single fill layers as deep as 24 inches.

Rock separation

Handling and compaction of fill material is rendered difficult by the presence of loose stone.

Rocks of even small sizes interfere with grading. If their diameter is greater than that of the fill layers, they will project from the top. If two or more rocks are in contact, they are liable to prevent even distribution and compaction of fill under their adjoining edges.

For this reason, the size and number of rocks present in thin or layered fills are often limited. This may be done by using selected borrow, or by putting bouldery material through a grizzly.

Oversize material may be allowed to roll directly into trucks, be loaded from beside the grizzly, dozed away from it to a stockpile, or, if the grizzly can be located on the edge of an abandoned pit, allowed to accumulate.

One or two men are needed to free oversize stones stuck between the bars and to coordinate the trucks. If the stones are a substantial part of the bulk of the soil, smaller trucks may be used under the grizzly than on top of it.

If sticking of stones or sliding off of chunks of earth is much of a problem, a vibrating grizzly, or a standard grizzly with a vibrator bolted to it, may be desirable.

Rock fill

Various results are obtained from all-rock fills. If the largest pieces are smaller than the depth of the fill and sizes are mixed to include a good proportion of fines, a solid fill with a good surface may be obtained by pushing piles off an edge with a bulldozer. Large pieces tend to move ahead and over the bank, while smaller ones drift under the blade to form a topping.

If there are not enough small pieces to provide a working surface, finer material should be brought to fill surface holes and even off the top.

Rocks too large to fit in the fill can be rolled ahead of it until a hole is found or is made to bury them, or they are reduced by splitting or blasting.

Rock fills generally cannot be compressed, except when rock is soft or fissured and very heavy weights are used. However, they are apt to be subject to only minor and local settlement, where fines are shaken or washed into spaces between rocks below them.

Rock is desirable fill material for the bottom layer in crossing water or mud, as it is not softened by contact with water and spreads surface loads over large areas of the base. In such locations it may settle due to displacement or compression of the ground under it.

The volume of fill is greater than the unbroken rock in the bank. The difference will vary with the quality of rock, type of fragmentation, and amount and kind of compaction. Fifty per cent is a rule-of-thumb average that can be used except where there are indications to the contrary.

If the rock must be used in the fill, it is best placed at the bottom. Unfortunately, rock is ordinarily the last material to be taken from a cut as soil is stripped prior to blasting.

Scraper fills

The standard method of building a fill with scrapers is to start with an area sufficiently leveled to allow the scrapers to travel on it, and to build it up in thin layers, starting at the outside edges or at low spots.

Spreading depth may vary from 2 inches to the maximum lift of the bowl—8 inches to a foot. Thin layers favor compaction, particularly if the scrapers are depended on for the rolling, and facilitate smooth building up of the grade. Chunky, sticky, or rocky fill will not spread thin, or can be made to do so only by very slow travel during the dump.

Loose fills of sand, clean gravel, or too-dry dirt tend to cave under the weight of machinery close to the edges. Finer-grained fills may have excellent bearing power if well compacted and not too wet. However, while being compacted, they tend to squeeze outward, and an allowance for this creeping must be made when placing the first fill so that it will not move out past the toe stakes.

The behavior of the fill on edges may be anticipated by making a soil analysis or by consulting with contractors or operators who have worked with the same formation.

F-100 8-ft. Pickup—GVW 5,000 lbs.

T-800—GVW 42,000 lbs.; GCW 65,000 lbs.

Ford saves you money withne

YOU SAVE ON PARTS REPLACEMENTS—*add miles to engine life!*

YOU SAVE ON SHOP LABOR—*cut maintenance to the bone!*

YOU SAVE ON YOUR ORIGINAL INVESTMENT—*get more work done per truck!*

Ford Trucks for '56 save you money right from the start. And, they keep on saving with their extra-sturdy, long-life engine design.

For instance . . . Ford Engineers have now introduced into all heavy-duty engines the greatest valve advancements ever. As an example, see the exhaust valve in diagram on right page. The valve stem is hollow and partially filled with powdered sodium. When the sodium gets hot, it *turns into a liquid.* As it moves up and down, it carries heat away from valve head—*allows it to operate up to 225° cooler!* Result: a cleaner-running, more burn-free, longer-lived valve face.

Ford's long-lasting engine design pays off for you in every way. You save money on parts replacements such as piston rings and bearings. You save on shop labor—extend time between preventive maintenance jobs like valve adjustments, valve grindings, compression tests, ring jobs and the like.

And you can save on driver costs if you can keep trucks out of the shop and on the road. Yes, you save in every way when you get more work done per truck!

There's a Ford Truck for every trucking job. Before you buy your next truck, Test Drive a Ford Economy Truck.

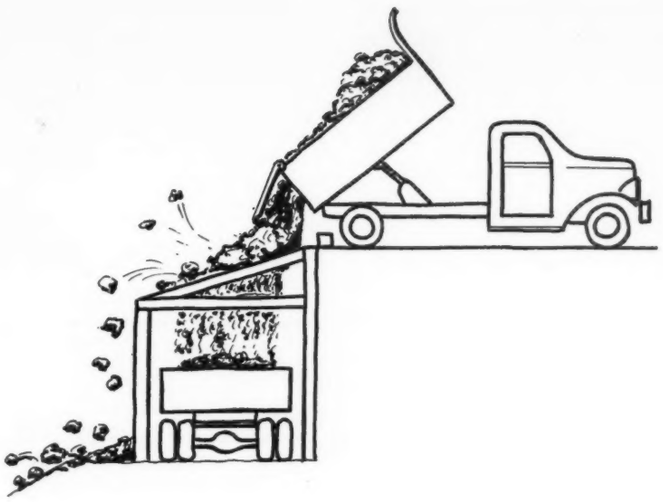
FORD TRUCKS LAST LONGER

Certified by independent insurance actuaries for the ninth consecutive year! Studies of over 10,068,600 current license registrations show that Ford Trucks last up to 9.9% longer than any of the other 4 leading truck makes!

Except for allowance made for creeping under load or spillage from above, which seldom should be more than a foot or two, the fill is started at the toe line and built up of layers, usually not over 6 or 8 inches, loose. Each layer should be rolled with a tamping roller that is allowed to project slightly beyond the edge. For this purpose, two or more rollers should be fastened in a single yoke so that their width will be substantially greater than that of the towing tractor.

If watering is required for proper compaction, application may be somewhat heavier at the edge to allow for side evaporation. However, it should not be sufficient to make it soft or muddy.

The fill should slope up at the edges in order to incline the center of gravity of the machinery toward the center and minimize the danger of caving. If the fill is narrow it will have a trough shape, and if wide, it will be flat with raised sides.

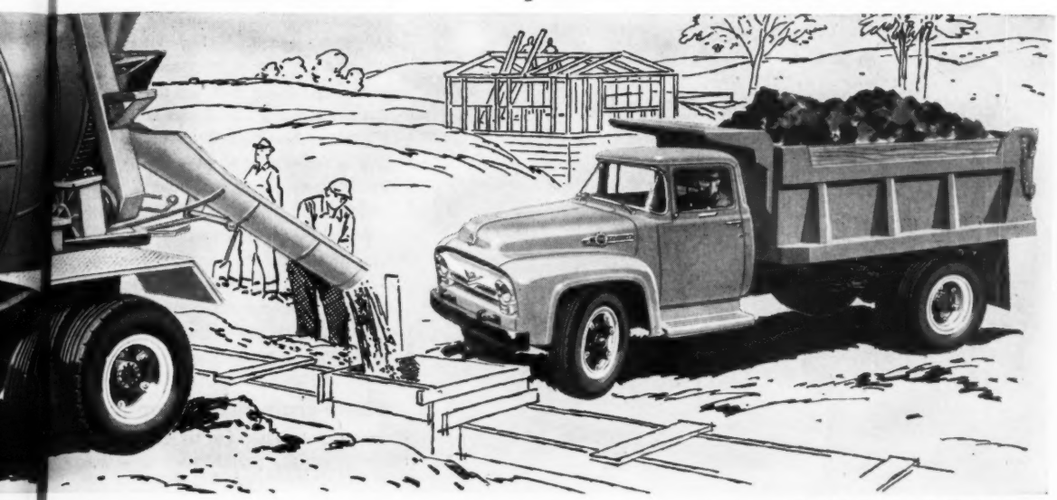


If the job is shut down during any period when rain is expected, it may be wise to build the fill up to a crown in order to allow it to drain. This involves resloping the edges on resumption of work and, if the work is done under exact compaction specifications, may cause confusion in the treatment of the tapered layers required.

Another treatment is to preserve the trough but so grade it that all water will flow to selected low spots. Here ditches are dug through the raised edges, and troughs of metal or wood placed to lead the water down the slope. This is readily done in hilly country where most of the road is on definite gradients, but not in level country.

Such drain ditches may be made wide and gentle, so that they can be dug, backfilled, and compacted by machinery, or may be hand dug, refilled, and tamped.

(To be continued next month)



F-900—GVW 29,000 lbs.; GCW 60,000 lbs.

rhnew long-life engine design

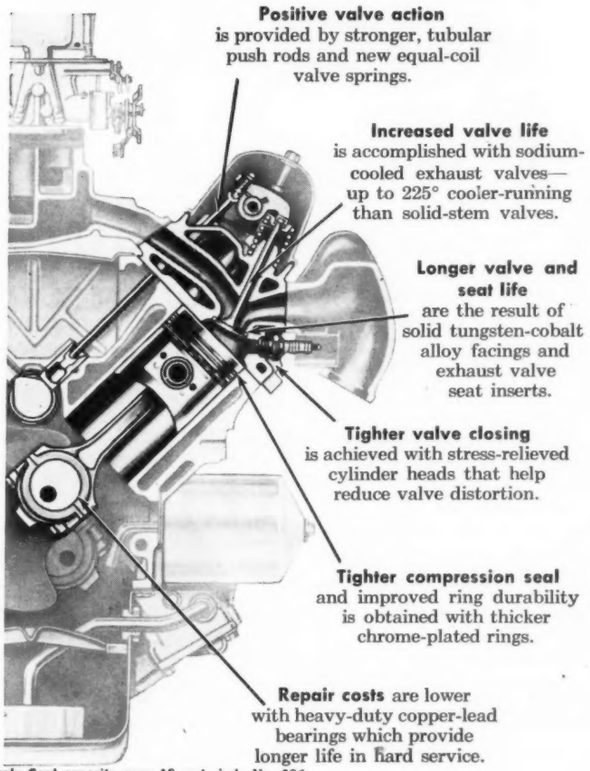
Hauls up to 3000 lbs. more than other 6-wheelers—New Ford T-800

● New power and hauling capacity of the Ford Tandem BIG JOB cuts hauling time on every run—makes giant cargos seem lightweight. You have a choice of two gas-saving Short Stroke engines. Either the 190-h.p. *Torque King* Y-8 or, the 200-h.p. *Torque King* Special Y-8.

You have new engine advancements for longer life (some explained and illustrated at the right).

New high-capacity tubeless tires, heavy-duty 5-speed transmission and Power Steering are standard equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-air brakes are available at low extra cost.

New *Driverized* Cabs for driving comfort and convenience have *Lifeguard* Design safety features found in no other truck. Lifeguard steering wheel helps protect driver from steering column; Lifeguard door latches help keep doors from jarring open in case of accident.



Positive valve action is provided by stronger, tubular push rods and new equal-coil valve springs.

Increased valve life is accomplished with sodium-cooled exhaust valves—up to 225° cooler-running than solid-stem valves.

Longer valve and seat life are the result of solid tungsten-cobalt alloy facings and exhaust valve seat inserts.

Tighter valve closing is achieved with stress-relieved cylinder heads that help reduce valve distortion.

Tighter compression seal and improved ring durability is obtained with thicker chrome-plated rings.

Repair costs are lower with heavy-duty copper-lead bearings which provide longer life in hard service.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 286

Tractor-mounted mixer

■ The Transmix, a transporting mixer of 1½-bag capacity at five-to-one ratio, is illustrated and described in a mailing piece from Universal Pulleys Co., Inc. Rear-mounted on a tractor, the barrel is turned by friction from a power-takeoff extension to a standard 6.70 × 15 tire attached to the mixer barrel. Illustrations show such features as the four high-quality airplane wheels on which the mixing barrel rolls.

To obtain this literature on the Transmix write to Universal Pulleys Co., Inc., 330 N. Mosley, Wichita, Kans., or use the Request Card at page 18. Circle No. 198.

Portable space heaters

■ A mailing piece showing models in the line of Sonic-Ray portable space heaters is available from The Bica Co., 1170 N. State St., Girard, Ohio. These heaters, which may be used indoors or out, are made of heavy-gage steel, weigh 31 pounds, and operate on LP gas or city gas. Rated output for the standard models is 85,000 Btu, and for the AGA-approved models, 50,000 Btu.

To obtain this mailing piece write to the company, or use the Request Card at page 18. Circle No. 183.

Tractors and scrapers

■ Literature on the DW20 and DW21 tractors and companion Lowbowl-designed Nos. 456 and 470 scrapers is available from the Caterpillar Tractor Co. Pictures of these models and their outstanding features are included, together with specifications.

To obtain Form No. 31690 write to the Advertising Division, Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 175.

New bulletin gives data on 3-yard shovel

■ A new 16-page bulletin describes the Bucyrus-Erie 71-B shovel by means of pictures, an explanation of the machine's features, and a list of general specifications.

The Model 71-B, which uses a 3-cubic-yard bucket, is readily convertible to dragline, clamshell, or lifting crane, according to this bulletin. It is powered by a GM six-cylinder diesel engine equipped with Torcon torque converter. A diesel engine with conventional drive is also available.

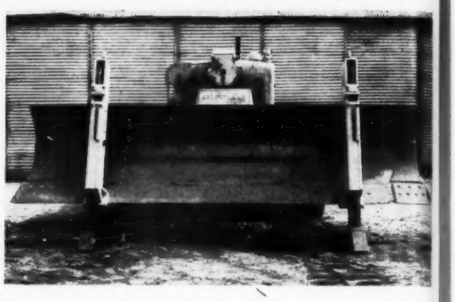
Other features include fully independent boom hoist; one-piece cast-steel revolving frame; 12 conical hook rollers; a choice of four A-frames; and four optional crawler mountings.

To obtain Bulletin 71-B-1 write to Bucyrus-Erie Co., South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 159.

Fuel-injection pump

■ Cutaway pictures on the Roosa Master fuel-injection pump are contained in a catalog from The Hartford Machine Screw Co., 92 Deerfield Road, Hartford 2, Conn. The pump, according to the manufacturer, may be used on all major types of high-speed diesel engines, and can be flange, distributor, or bracket-mounted. It is available with engine, hydraulic, or centrifugal flyweight governor.

To obtain this catalog write to the company, or use the Request Card at page 18. Circle No. 181.



The new Ransome rippers adjust to fit on a wide variety of dozer blades.

Adjustable rippers mount on dozer blades

■ Two new rippers designed to fit on dozer blades of any make and recommended for a variety of ground and pavement-breaking applications have been announced by The Ransome Corp. Featuring welded box construction of heavy-duty steel, the units may be mounted in any position on a dozer blade.

The Model R-46, specifically designed for Caterpillar 4A, 4S, 6A, and 6S blades, can be used on blades from 27 to 38 inches in height. It may be adjusted for ripping depths of 6, 10, 14, and 18 inches. The Model R-78, designed especially for use on Cat 6S, 7A, 7S, 8A, and 8S blades, can be adjusted to fit blades from 35 to 48 inches in height. Ripping depths for this model are 6, 12, 15, and 18 inches.

The new Ransome rippers also feature a removable ripping tooth and one-man rack and pinion-depth adjustment.

For further information write to The Ransome Corp., 2729 Hunting Park Ave., Philadelphia 29, Pa., or use the Request Card at page 18. Circle No. 142.

Direct-from-drum pump for spraying form oil

■ An air-operated direct-from-drum pump that quickly empties form oil from 55-gallon drums is available from Gray Co., Inc. The pump operates either in the open head or 2-inch bung opening of original drums.

Operating on air pressures from 35 to 200 psi, the Graco Fast-Flo pump is said to empty a full-size drum faster than the form oil can be poured from the bung. The lightweight (13½ pounds) pump may be easily switched from the emptied drum to a full one.

The Graco Fast-Flo pump.

Equipped with an extension nozzle, the unit may be used to spray form oil. All hard-to-get-at areas of the form are covered quickly, and the adjustable nozzle may be varied for heavy or fine spray to suit the operation.

For further information write to Gray Co., Inc., 1033 Sibley St. N. E., Minneapolis, Minn., or use the Request Card that is bound in at page 18. Circle No. 144.

YOUR WICKWIRE ROPE DISTRIBUTOR SUPPLIES THE ANSWERS TO WIRE ROPE PROBLEMS

One of the best ways to find out "what goes" is to be right on the spot. That's why a Wickwire distributor is a wire rope expert—he practically lives with the industries he supplies with wire rope. He knows his customers' specialized problems from first-hand experience, and is able to give competent practical advice on the best construction—6x19, 6x37, 8x19, etc.—for them to use. And he delivers the type, size and length of wire rope they need directly from his warehouse stocks. They save time...storage space...paper work.

Your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and wire rope slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.

CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 287

3153

New carbide-insert bit for J-7.50 drill rods

■ A carbide-insert Rok-Bit designed especially for use on J-7.50 threaded drill rods is announced by Brunner & Lay Rock Bit Corp. The bit is available in 4 and 4½-inch-gage sizes, and is made to fit directly on the steel without the need for an adapter.

The new bit has a center hole, two additional holes on the face, and two more on the sides—five air holes in all. This arrangement, according to the manufacturer, means better chip removal, so that the bit is not working in its own cuttings. The bit is also said to stay sharp longer, drill faster and more economically, and require less reconditioning.

For further information write to Brunner & Lay Rock Bit Corp., 9250 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 141.

Two-way radios

■ A compact two-way radio designed to operate from the power supply of any vehicle is illustrated in a folder from Bendix Radio. The Trafficmaster, easily mounted in the trunk of a car or under the dash of a truck, is available in models which operate on 2½ to 60 watts output or ac and dc inputs, according to the literature. Other models in the Bendix Command-Air series—the Powermaster, Stationmaster, and Multi-Master—are shown with a complete line of accessories.

To obtain this bulletin write to the Bendix Radio Division, Bendix Aviation Corp., 2120 N. Charles St., Baltimore 4, Md., or use the Request Card at page 18. Circle No. 185.

Concrete buckets

■ A bulletin describing and illustrating Gar-Bro lightweight, heavy-duty, and standard-duty buckets, and power-operated crane hooks, is available from Gar-Bro Mfg. Co. Special attention is given to vertical-discharge and extended-gate-type laydown buckets. Accordion-type rubber hoppers and suspended steel subhoppers are also described. Accompanying each model are specification charts and a list of outstanding features.

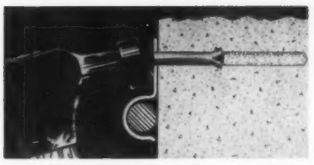
To obtain Bulletin No. 110 write to Gar-Bro Mfg. Co., 2415 E. Washington Blvd., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 194.

New masonry rivet is one-piece unit

■ A one-piece rivet for nailing metal to brick, cinder block, concrete, and similar materials is offered by the Southco Division of South Chester Corp. The device can also be used for sandwich construction of sidewalls, enamel facing plates, and corrugated asbestos or metal siding.

No special tools are required in using this rivet, which is inserted in a drilled hole and driven with a hammer. When the protruding pin is driven into the rivet, the ends of the rivet spread, anchoring the fastener to the brick, concrete, or other masonry material.

The Southco masonry drive rivet is available in six lengths ranging from 1⅛ to 1¾ inches. Standard diameter is ¼ inch. The rivet is aluminum, and the pin is stainless steel.



The Southco masonry drive rivet anchors metal to brick, concrete, and other masonry material. It is made by the Southco Division, South Chester Corp., Lester, Pa.

For further information write to Southco Division, South Chester Corp., 200 Industrial Highway, Lester, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 146.

New bulletin discusses soil stabilization

An appraisal of current knowledge of soils and soil stabilization is presented in "Soil and Soil-Aggregate Stabilization", Bulletin 108 of the Highway Research Board.

Presenting 14 papers by engineers and scientists, the 175-page book discusses the fundamental nature of soil, the art and science of stabilization in various types of soil, and the factors that influence soil stabilization.

Originally presented at the thirty-fourth annual meeting of the board in January, 1955, the bulletin is available at $3 per copy from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

FOR FAST EXCAVATING AND EARTHMOVING

Dependable Hydraulic Action . . . Economical Diesel Power!

Here's an excavating, earthmoving, and bulk material handling "team" that can't be beat—

- **The Sherman Power Digger**—Excavates to 10′ below grade. Trenching and bellhole shovels, 12″ to 39″ wide.
- **The Sherman Front End Loader**—Bucket lift, 10′10″. More reach than any comparable machine. Load capacity to 2500 pounds, ⅝ cubic yard.

Mounted on the economical Fordson Major Diesel Tractor, both are low in initial cost and upkeep. Sold and serviced by Ford Tractor dealers everywhere. Ask your dealer for an on-the-job demonstration . . . or write for free literature on both machines to Dept. No. 613.

The Sherman Power Digger is designed, engineered and manufactured jointly by the Sherman Products, Inc., Royal Oak, Michigan and Wain-Roy Corp., Hubbardston, Mass. Patent No. 2-303-852, others pending.

★ ★ ★

The Sherman Front End Loader is manufactured exclusively for Sherman Products, Inc., by Johnson Hydraulic Equipment Co., Minneapolis, Minn.

★ ★ ★

© 1955, Sherman Products, Inc.

Sherman

PRODUCTS, INC.
ROYAL OAK, MICHIGAN

Sherman SP Products

For more facts, use Reader-Reply Card opposite page 18 and circle No. 288

Field office manager R. A. Buenker listens to a report from one of the foremen on the condition of equipment. Mrs. Buenker, radio dispatcher, stands by at the microphone.

Two-way radio saves time on lengthy paving spread

Use of radio permits full and instantaneous supervision, allows quick maintenance and flexibility in work

by ROBERT V. CAVE, secretary
Standard Paving Co.
Chicago, Ill.

Reconstruction work on U. S. 66 in Illinois had hardly been started by our firm when it became obvious that the length of the spread was going to create a tough communications problem. Our contract called for the construction of an additional road to convert an old two-lane into a modern four-lane dual highway separated by a grass median. The road was to run from Chenoa to a point one mile south of Dwight—a total of 24.7 miles.

The job was hardly underway when we realized that supervisory personnel were going to have to do a lot of traveling because of the length of the spread.

Standard Paving Co. had been considering using a two-way radio system for some time, and when this job was started, the advantages offered by the system seemed more attractive than ever. We obtained an FCC license to operate a special industrial radio system and then installed two Motorola base radio stations and nine mobile radio units.

Operating on 43.02 megacycles, the system enabled us to coordinate and organize all phases of the work from the field office. A short radio conversation with foremen on various spreads gave a more complete summary of the job's progress than we had ever been able to get in the half day spent riding from spread to spread.

Radio-on-the-move helped our maintenance crew one day shortly before quitting time. A grader had broken down and the foreman radioed for a mechanic. He arrived in three minutes, spotted the trouble, and in less than five minutes was using the radio himself to order the necessary repair parts. Within an hour, a parts jobber had been notified, the parts had been delivered, and the grader was back in action.

Had we not been equipped with mobile radio, the grader would not have been repaired until the middle of the following day because of delays in notifying mechanics and ordering parts.

Radio also improved the coordination between paving crews and men at the batching plant. At the height of our pouring period, we ran as many as 40 concrete trucks out of the batcher. Changes in batching orders could be dispatched quickly by radio.

Instant shifts on the go

BIG NEW ADVANCE in shovel-type loaders is the Hough Model HO 4-wheel-drive PAYLOADER.

And one of the biggest features of this 2-yard workhorse is its great new TORQMATIC DRIVE designed by Allison expressly for shovel-type loaders.

Hough calls this integrated TORQMATIC Converter-Transmission team the "easiest-operating, fastest-acting, most efficient power-shift transmission ever put into a tractor shovel."

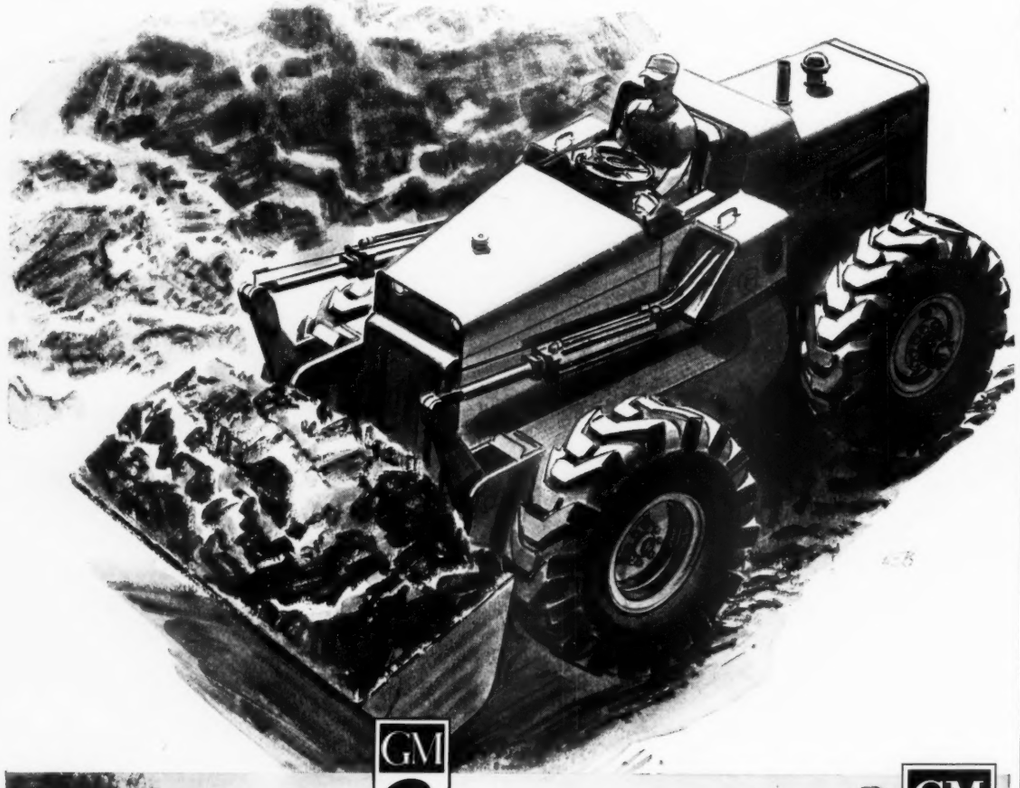
And they also say that the TORQMATIC DRIVE *permits "instant shifting from any speed range to any other on the go —no stopping, no foot clutching."*

That means faster job cycles, easier loader operations, more yardage moved per shift.

The HO PAYLOADER is available with either gasoline or Diesel power. The engines will last longer, operate more efficiently driving through a TORQMATIC Converter because it instantly matches engine speed and torque to the load—multiplies engine torque up to 350% to broaden the *working* horsepower range.

Today Allison's new TORQMATIC DRIVE is available in many models of shovel-type loaders—will soon be offered in a wide range of other equipment made by leading manufacturers.

If you'd build or buy a better product, get full information on this great new TORQMATIC DRIVE by writing to Allison Division of General Motors, Box 894C, Indianapolis 6, Indiana.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 289

A field man reports on the progress of a concrete-pouring operation. This two-way Motorola mobile radio enables any changes in schedules or orders to be transmitted quickly.

saving tons of concrete and dozens of man-hours in overtime.

In the office, as well as in the field, there was a substantial improvement in over-all operating efficiency. The superintendent was able to keep in touch with all his foremen when he was in the office. When he was in the field, foreman had no difficulty in locating him. Then, too, mobile radio gave us a new flexibility in scheduling and enabled us to effect changes quickly and efficiently. Savings in time and labor costs that resulted from this were enormous. Maintenance was quickened, too, since mechanics and parts could be located without delay.

Naturally, special problems still require the superintendent's personal inspection every day, but the travel involved is only a fraction of that done in the days before we used radio. When Standard starts another big contract on U. S. 66 this year, we will again rely on Motorola two-way radio to keep things going quickly and smoothly. None of us ever wants to start another job without it.

THE END

Do-it-yourself manual

A handbook for purchasing tools and materials for do-it-yourself projects has been issued by the Popular Mechanics Press, 200 E. Ontario St., Chicago, Ill. "Do-It-Yourself Materials Guide" discusses such subjects as woods, floor coverings, electrical and plumbing supplies, and suggests the proper materials to be used in given situations.

Charts, diagrams, and photographs make the handbook easy to read and simplify instructions.

Written by Clifford B. Hicks, associate editor of "Popular Mechanics Magazine", the book is available through the publisher at $3 per copy.

Film on wire and wire rope

A black and white 16-mm film, "Lifeline," shows the step-by-step processes in making wire and wire rope and demonstrates their applications in the construction industry. The 22-minute film available to engineering societies, clubs, and associations on a loan basis, may be obtained by writing to the public relations manager of Macwhyte Co., Kenosha, Wis.

Line of excavators

■ Action shots of Insley excavators and cranes—Models L, K, and WB—with 5 to 35-ton capacity, are shown in a folder from the manufacturer. This line is available with crawler, self-propelled carrier, or lorry mounts, and with gasoline, diesel, or electric power.

To obtain this folder write to the Insley Mfg. Corp., P. O. Box 167, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 192.

Hardsurfacing alloys

■ Literature on the newly developed Coast Metals line of hardsurfacing alloys describes alloy-filled tubes, either in coils for automatic welding or cut to length for manual application. The composition, description, welding specifications, characteristics of hardsurfacing deposit, and applications of seven types of tube rod are given.

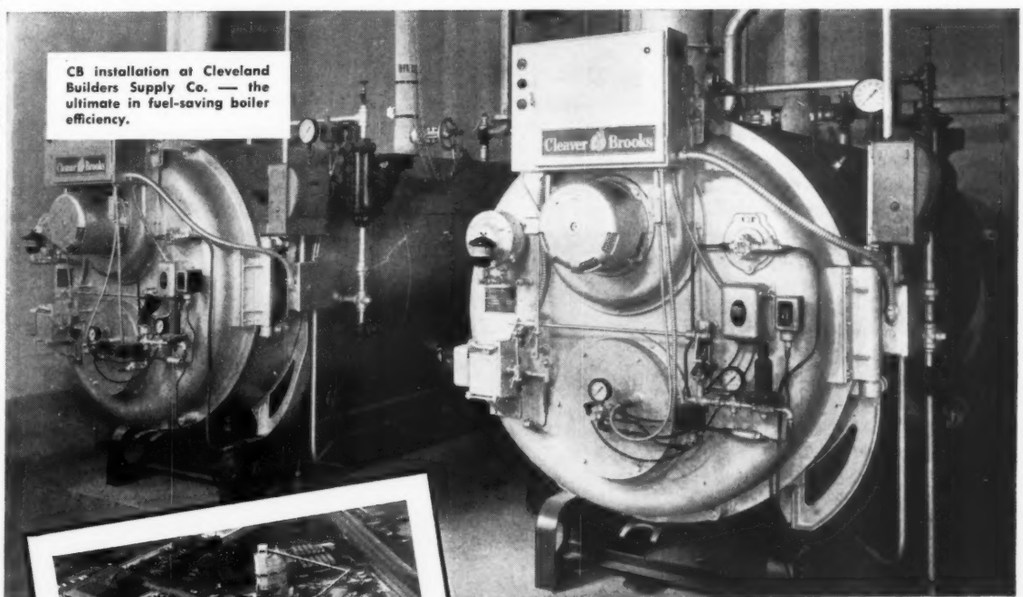
To obtain this literature write to Coast Metals, Inc., 201 Redneck Ave., Little Ferry, N. J., or use the Request Card at page 18. Circle No. 179.

Film on landfilling

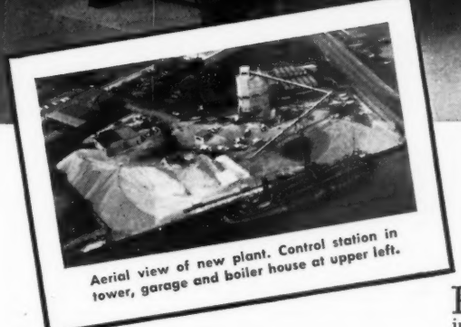
Construction Aggregates Corp., 33 N. LaSalle St., Chicago, Ill., has filmed some of the operations of the Sensibar method of landfilling developed by the corporation's president, J. R. Sensibar. The color movies are available to interested groups through the firm's public relations office.

Keeping the water hot . . . for America's first electronic ready-mix plant

A job well done by new CB boilers

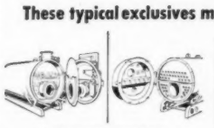


CB installation at Cleveland Builders Supply Co. — the ultimate in fuel-saving boiler efficiency.

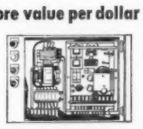


Aerial view of new plant. Control station in tower, garage and boiler house at upper left.

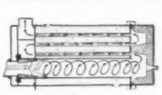
These typical exclusives mean more value per dollar



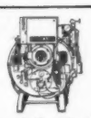
EASY MAINTENANCE — Hinged doors, front and rear, swing out of way when cleaning tubes.



EASY OPERATION — Controls on front head. Electronic combustion device standard equipment.



FOUR-PASS DESIGN AND FORCED DRAFT—Scrubs more heat from long gas travel. Combustion air in constant supply.



OIL, GAS OR COMBINATION OIL/GAS FIRING—10-second fuel interchange. Full flexibility for greatest economy.

New Cleaver-Brooks CB boilers meet all heat demands for continuous, high-capacity, winter-time operations

PLANT "J" of the Cleveland Builders Supply Co. is the first to utilize the recently developed Butler electronic batching system. *The firm sought to apply the absolute last word in technological progress in selecting equipment* — for efficiency, compactness, flexibility and accuracy of control for concrete quality.

Installation of modern, oil-fired CB boilers in this entirely new plant — possibly the largest in the U.S. — was, therefore, a "natural." The twin 80-hp units provide *all heat for winter* operations, helping maintain the high-level 180-200 cu. yd. per hour schedule set up for the year.

Most modern boilers of their class

New CB brings *big boiler standards* to users in the 15 to 150-hp class. Unit is years ahead in function, safety and appearance. Money-saving performance is proved on hundreds of installations! For complete details, write for new CB bulletin. Cleaver-Brooks Company, Dept. A, 396 E. Keefe Ave., Milwaukee 12, Wisconsin, U.S.A. Cable Address: CEEBEEWEST — all codes. Ask for catalog AD-137.

Cleaver Brooks 25th YEAR

TWENTY-FIVE YEARS OF LEADERSHIP
BY THE ORIGINATORS OF THE SELF-CONTAINED BOILER

For more facts, use Reader-Reply Card opposite page 18 and circle No. 290

Excess material left as surcharge is trimmed to grade ahead of the base-laying operation by a Caterpillar D6 tractor pulling a Gar Wood 7-yard scraper.

C&E Staff Photos

Before base materials are laid out, an Allis-Chalmers AD-40 motor grader dresses the subgrade.

Sand-shell material provides low-cost base for expressw

Along the Texas coastal plain, where sand and sandy loams are plentiful, coarse aggregates are expensive and must be shipped to the area from distant points. But oyster shell, which can be reclaimed from reefs in the nearby Gulf of Mexico by hydraulic or bucket dredges, can be combined with the native sand or sandy loam to produce a strong, durable, and economical base for pavement. The use of the mixture becomes even more economical when the shell can be delivered to job locations by water.

This was the situation existing for Worth Construction Co., Fort Worth, Texas, general contractor on a 5-mile section of U. S. 90 between Beaumont and Vidor, Texas. Worth's job included base and bituminous and concrete paving on this section of the interstate system which was developed to full expressway standards on an entirely new alignment.

A 14-inch compacted sand-shell base underlies the two 24-foot roadways paved with 3 inches of asphaltic concrete, and a 4-inch sand-shell base underlies the 9-inch uniform concrete paving put down at the U. S. 90 and FM 10 S interchange.

The asphaltic - concrete roadways are separated by a raised concrete median 4 feet wide and 7 inches high, which is continuous from Beaumont to Vidor, so that no traffic can cross the main roadways. The 10-foot-wide outside shoulders, with the same sand-shell mixture used for the pavement base, were given a penetration treatment of asphalt and covered with white aggregate to provide a good contrast with the black surface of the roadways. Frontage roads along both sides of the right-of-way give access to adjacent property. These roads, which have curb and gutter on the property side within the limits of the village of Vidor, loop under the four bridges included in the project to provide access from one side of the road to another. In times of severe flood or extremely high tides, these bridges will also provide for relief waterways.

Grading with dredge fill

Grading was done under a separate contract by W. R. Aldrich & Co., Baton Rouge, La., which excavated

Best way to make your contracts pay—

PRODUCTION UP 30%—FUEL COSTS CUT 30%

Arizona Sand & Rock Company replaced a 4-cycle Diesel with a 2-cycle GM Detroit Diesel on this pug mill. Despite clouds of dust, maintenance costs dropped 25%—and production control is better with fast-acting, 2-cycle Detroit Diesel power.

KEEP 600,000-YARD CONTRACT GOING

Marsolino Construction Co. relies on GM Detroit Diesel-powered Ingersoll-Rand Gyro-Flow compressors to keep this 600,000-yard contract moving. They report the Detroit Diesels "start easily—are dependable and economical."

CUTS FUEL COSTS 40%—UPS PRODUCTION 25%

When Miami's R. E. Vaughan, Inc. switched from a 4-cycle Diesel to a 2-cycle GM Detroit Diesel on this ditcher, production jumped 25%—fuel costs dropped 40%. They report the Detroit Diesel delivers more power at less cost, too.

TRAVELS 35 M.P.H. ON THE HIGHWAY

Speed like this *between* jobs means more time on the job for this GM Detroit Diesel-powered Warco grader operated by Michigan's Henry Schmid Sons. Company's Detroit Diesel-powered dragline has worked over 17,000 hours on $100 for repairs.

SPECIFY GM

in all your Construction Equipment

NAME the construction equipment you need—and it's a sure bet that you can get it powered with a General Motors Detroit Diesel.

For more than 150 manufacturers offer GM Detroit Diesel power in over 1,000 different applications—*because it's America's first choice Diesel!* With their reputations riding on every piece of equipment they sell, it's certain these manufacturers pick the best Diesel available to power their products.

And when you specify a GM Detroit Diesel in your construction equipment you get a Diesel that costs less to buy, less to run, and less to maintain.

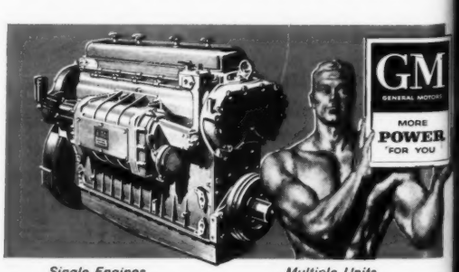
You get a Diesel that delivers more power from a smaller, lighter engine.

And you get a Diesel backed by a nationwide network of GM Detroit Diesel Distributors ready to give you fast service and quick delivery of low-cost parts *day or night.*

Your local GM Diesel Distributor or dealer can give you the list of equipment powered with GM Detroit Diesel engines. Call him today or write direct.

DETROIT DIESEL

Engine Division of General Motors, Detroit 28, Michigan



Single Engines... 30 to 300 H.P.

Multiple Units... Up to 893 H.P.

AMERICA'S LARGEST BUI

ll dredged from the Gulf is unloaded from a barge at the job site by a ehring 504 crane with a Williams 1½-yard clamshell.

The sand and shell are blended by a Seaman Pulvi-Mixer, towed by a Farmall tractor which has dual rear wheels for extra flotation.

ll dredged from the Gulf of Mexico is delivered by barge economical in-place mixing with native sandy loam

DETROIT DIESEL POWER

NO REPAIRS IN 10,000 HOURS

In 1951, Minnesota's Phelps-Drake Construction Company bought a GM Detroit Diesel-powered Lima Paymaster. And in 1953, they bought a second Paymaster plus a Wellpoint pump—both GM Detroit Diesel-powered. At last report none of the engines had any repairs, were still going strong after more than 10,000 hours. Phelps-Drake also reports production is high—fuel cost low—with Detroit Diesel power.

BUILDER OF DIESEL ENGINES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 291

approximately ten feet of muck through more than a third of the length of the job and backfilled with clean white sand placed by a hydraulic dredge. For the remainder of the job's length, grading was done with the available sandy loam soil, handled by scrapers and other conventional grading equipment.

Anticipating a settlement of material in this swampy area, Aldrich left a surcharge above the finished subgrade level. But little or no settlement occurred, and the excess material had to be removed to bring the grading section to proper subgrade.

Worth used two C Tournapulls and two Euclid scrapers with an Allis-Chalmers HD-19 push-tractor to load this material from the roadbed and haul it to the frontage roads and bridge approach fills. Then a Caterpillar D6 tractor with a Gar Wood 7-yard scraper worked with an Allis-Chalmers AD-40 motor grader to trim the subgrade exactly.

A second operation which had to be completed before base work could proceed was the installation of 6,500 linear feet of 18 to 60-inch reinforced-concrete pipe drains. This part of the work was sublet to Charles Cohen, Marshall, Texas. Cohen used a Lorain ¾-yard and an Insley ½-yard machine to dig the trench and place the pipe. Small trenches were compacted in the roadway area by pneumatic tampers. On wider ones, compaction was obtained with tractors drawing sheepsfoot rollers.

Barge delivers shell

As shell was dredged from the Gulf, it was first screened and washed to remove small fragments and foreign material, then loaded directly onto barges. Towboats brought the loaded barges up through the Intracoastal waterway system and the Neches River to a dock at the job site, where they were unloaded by a Koehring 504 crane with a Williams 1½-yard clamshell bucket.

When the fleet of Ford 8-yard dump trucks was hauling to the roadway, the crane bucketed the shell directly to the 15-yard elevated hopper set up on the dock as a surge bin. Otherwise, barges were unloaded to stockpiles. Using this system, Worth delivered 180,000 cubic yards of shell to the job.

In the area where the hydraulic

Compaction is provided by three Ingram sheepsfoot rollers pulled by a Caterpillar D6 tractor with dozer.

C&E Staff Photos

The final layer of the base is finished to a smooth density by a Grace 9-wheel rubber-tire roller drawn by an Allis-Chalmers 40 tractor.

fill was to be placed, the sand was too soft to support the equipment working on the base, so the subgrade was left a few inches low and a sand-shell working platform was built. The shell, end-dumped on the sand and spread by a dozer to a thickness of about four inches, was first mixed with some of the underlying sand by a Seaman Pulvi-Mixer. Then the shell and sand were compacted by a sheepsfoot roller to provide a platform which easily supported the trucks, motor graders, and other equipment constructing the base.

Sand-shell gives tough base

When the subgrade had been properly prepared, the first lift of shell was hauled in and spread on the subgrade. Then a lift of sandy loam obtained from an adjacent borrow pit was spread on top of the shell. The mix was proportioned at approximately one-third sand and two-thirds shell. The 14-inch compacted base was laid in three lifts. With a compaction factor of 1.7, it was necessary to start with a lift of loose material about 8 inches thick.

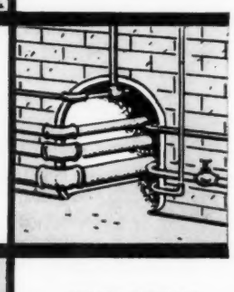
The individual oyster shells, which were more or less intact when the material was received on the job, have been broken up slightly during the unloading and hauling operations, so that some fines have been created. As the sand and shell were laid out on the roadbed by a Caterpillar No. 12 motor grader and an Allis-Chalmers AD-40 motor grader, a Pulvi-Mixer drawn by a Farmall tractor mixed the materials, break-

QUICK, LOW-COST ANSWER TO 4 PROBLEMS...

Flat-Base Pipe

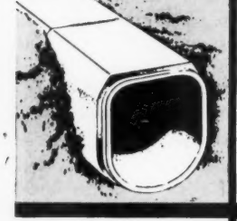
PEDESTRIAN UNDERPASS

The practical way to safeguard the lives of adults and children. Especially valuable near schools and playgrounds. Also helps to maintain an even flow of street-level traffic.



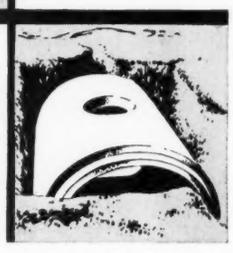
UTILITY GALLERY

Carries steam pipes, gas mains, electrical cables and telephone lines with ample room for workmen to make repairs. Flat-Base Pipe is also used for culverts and cattle passes.



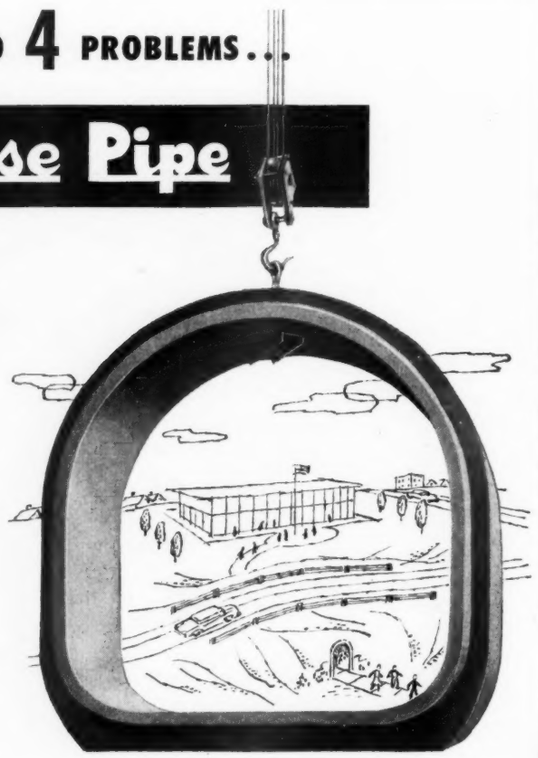
HEATED SIDEWALK

When installed inverted, the flat-base part of the pipe becomes a sidewalk. Steam or hot water pipes running through the Flat-Base melt snow on the walk and provide better, safer footing.



UTILITY MANHOLE

Manholes for utility companies have often been built with Flat-Base Pipe in less than four hours. This eliminates needless traffic delay and reduces labor costs to a minimum.



Save as much as *30%* in the construction of pedestrian underpasses, culverts, utility galleries and manholes—with pre-cast Flat-Base Pipe. You can place and cover from 52 to 100 feet of Flat-Base Pipe in a single day. No forms to construct . . . no steel reinforcing to position . . . no concrete pouring. Can be jacked through old construction or laid in new fills. Joints are tongue and grooved and can be made watertight with rubber gaskets. Available now, in a wide variety of standard sizes.

Our technical staff will be pleased to assist you with your pipe problems.

AMERICAN-MARIETTA COMPANY

CONCRETE PRODUCTS DIVISION

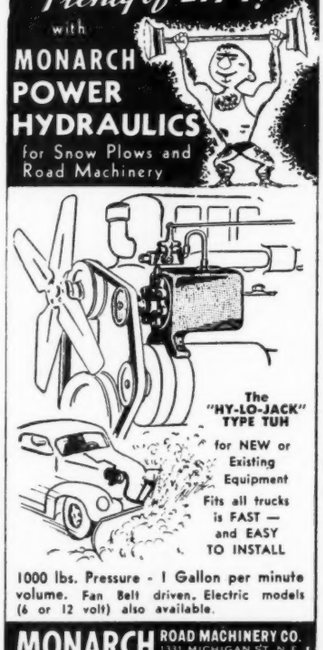
GENERAL OFFICES: AMERICAN-MARIETTA BUILDING, 101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS • PHONE WHITEHALL 4-5600

DIVISIONS AND SUBSIDIARIES

B. C. Concrete Company, Ltd. Concrete Products Co. of America Lewistown Pipe Company
Concrete Conduit Company Lamar Pipe and Tile Company Universal Concrete Pipe Co.
American-Marietta Company of Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 292

Plenty of LIFT! with MONARCH POWER HYDRAULICS for Snow Plows and Road Machinery



The "HY-LO-JACK" TYPE TUH for NEW or Existing Equipment

Fits all trucks is FAST — and EASY TO INSTALL

1000 lbs. Pressure - 1 Gallon per minute volume. Fan Belt driven. Electric models (6 or 12 volt) also available.

MONARCH ROAD MACHINERY CO. 1331 MICHIGAN ST. N. E. GRAND RAPIDS 1 MICH

For more facts, circle No. 293

Checking the progress of the job, left to right, are T. R. Ryan, superintendent for Worth; and H. J. Kelly and Leo Gunter, resident engineer and chief inspector, respectively, for the Texas State Highway Department.

ing up the shells a little more and creating additional fines. These fines seem to act as a binder for the mix.

After a thorough mixing by the Pulvi-Mixer and the graders, the lift was compacted by an Ingram 3-section sheepsfoot roller pulled by a Caterpillar D6 tractor. Water was added during the mixing and compacting operations to bring the moisture content to near optimum. The surface of each course was roughed up with the scarifiers of the motor graders before the next lift was added in order to secure a good bond between the lifts.

When the top course had been compacted with the sheepsfoot, it was brought to true grade and properly shaped by the Allis-Chalmers AD-40, watered, and then rolled with a Grace 9-wheel pneumatic-tire roller pulled by an Allis-Chalmers 40 farm tractor. This surface was left to cure out thoroughly before any traffic was permitted on it. The finished product was a very hard base with an appearance much like concrete and a density of from 110 to 120 pounds per cubic foot.

Surfacing

Surfacing of the thoroughly cured base began with the application of a tack coat of 1/10 gallon per square yard of MC-1 cutback asphalt. The asphaltic - concrete wearing course was then applied in two lifts of 150 pounds per square yard each. Shoulders were brought to grade with the sand-shell mixture and compacted in the same manner as the base course. Then they were given an application of oil-asphalt 230 and covered with white limestone chips.

Frontage roads were surfaced with 10 inches of the sand-shell material applied in two lifts. After compaction and curing, the roadway was given a two-course armor treatment, consisting of two shots of oil-asphalt 230. These shots, of 0.25 and 0.30 gallon per square yard, were followed by applications of ¾ and ½-inch aggregates.

The 9-inch uniform concrete pavement placed on the 4-inch sand-shell base at the U. S. 90 and FM 10 S interchange was put down in two 24-foot lanes separated by a 4-foot median. Paving was done with a Koehring 34-E dual-drum paver and a Jaeger finishing machine.

Personnel

Superintendent T. R. Ryan had charge of the base operations for Worth Construction Co., and J. W. Cumming supervised concrete paving. For the Texas State Highway Department, Leo Gunter was chief inspector, H. J. Kelly was resident engineer on the project, and E. R. Young was expressway engineer. W. E. Simmons is district engineer at Beaumont, and D. C. Greer is state highway engineer.

THE END

Labor rids us of three evils—irksomeness, vice and poverty.—Voltaire

FOUNDATION CONSTRUCTION

CAISSONS SHAFTS
DRILLED AND UNDERREAMED
PIERS

SPECIAL DRILLING PROBLEMS

Wire or phone for a quotation on your next foundation job —
Offices in
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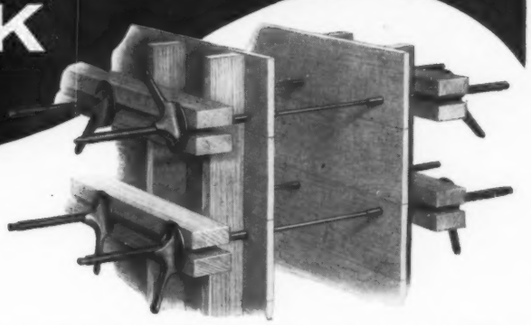
When job conditions call for this type of Heavy-Duty Tie . . .

use SUPERIOR TILT LOCK CLAMPS

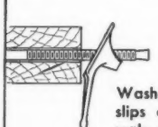


with SPECIAL Safety-Type Handle and Nut Washers

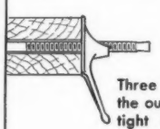
NUT WASHER

HANDLE WASHER

The malleable Handle Washer combines handle, washer and wrench—Designed for absolute safety; cannot fall off threads when load drops off or when handle is hit accidentally. The cast iron Nut Washer has all the features of Handle Washer except the open slot for use as wrench.



Washer, in tilted position quickly slips over stud rod threads to wale and is seated.



Three full turns on the threads of the outside rod bring it flush and tight against the wale. When pointing upward, the handle may be hit accidentally or pressure released during pouring. This may cause the handle to turn 180°, but the safety feature of 3 complete turns makes it impossible for the clamp to fall off the thread.

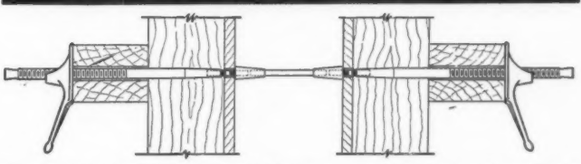
The "safety in use" of Superior's Handle and Nut Washers for Tilt Lock Clamps is shown at the left. The Tilt Lock Outside (Stud) Rods have outstanding features, too. The Outside Rod has ⅞" threads, five to the inch, rolled on a ¾" high carbon rod. This compares with the ¾" thread cut on a ¾" rod usually supplied. Cold rolled threads are tougher, and therefore more resistant to damage, and their contour greatly reduces the clogging of concrete and facilitates cleaning.

The Tilt Lock Outside Rod has a heavy cold forged rectangular end section that is ¾" wide and ½" thick, to which the Handle Washer is applied as a removal wrench. This forged section is practically indestructible, never becomes rounded after numerable reuses as does a milled end. Therefore, it is never necessary to use a Stillson.

Superior Tilt Lock Clamps are supplied with Outside Rods 16" long and 20" long, for both ⅜" and ½" inside tie rods. Extensions are available where field conditions require Outside Rods longer than 20".

Superior supplies high tensile inside rods with rolled threads. Form layouts and estimates are prepared from plans without charge or obligation.

with Cone Nuts for Spreader Action



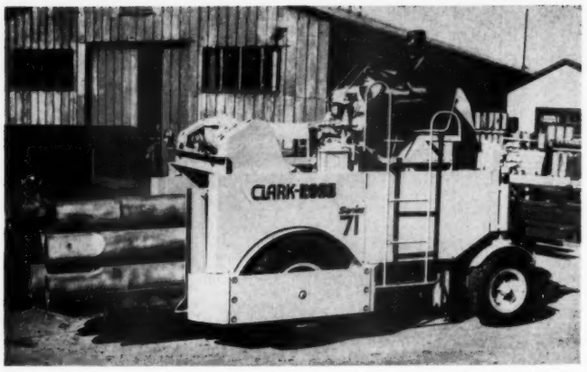
Where it is desirable to use Tilt Locks with Superior Cone Nuts for spreader action or other reasons, Tilt Lock Rods are adapted for use with Cone Nuts as illustrated above.

Tilt Lock Clamp Assemblies may be rented with a ninety day option to purchase.

SUPERIOR CONCRETE ACCESSORIES, INC.
4110 Wrightwood Avenue, Chicago 39, Illinois
New York Office
1775 Broadway, New York 19, N. Y.
Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 295

New design gives carrier 10,000-pound capacity



■ Special transmission, load-hook control, and steering features are incorporated in a new-model straddle carrier introduced by Clark Equipment Co. Designated as the Series 71, the machine has a rated capacity of 10,000 pounds.

Operator visibility and comfort have been increased by moving the driver's seat to the center of the machine, instead of over the rear axle, and lengthening the wheelbase to 90 inches—14 inches longer than the previous model.

Either a Ford 130-hp engine or a Hercules 91-hp engine, both gas and LP-gas-operated, powers the machine. A syncromesh transmission, with three speeds both forward and reverse, eliminates all remote shifting linkage. The hoist mechanism consists of a simple lever-and-link system actuated by a double-acting hydraulic cylinder. Hoist speed has been increased to 2.8 seconds—50 per cent faster than the previous model. Rigid load hooks have been lengthened to 117 inches for improved load distribution. Radi-arc steering gives the Series 71 the shortest turning radius of any carrier now available, according to the manufacturer.

The Series 71 is available in nine models capable of carrying loads ranging from 42 to 54 inches in height and from 40 to 52 inches in width.

For further information write to the Ross Carrier Division, Clark Equipment Co., P. O. Box 358, Benton Harbor, Mich., or use the Request Card at page 18. Circle No. 155.

Steam-cleaning compound for use with soft water

■ Clayton K-10 compound, a heavy-duty steam-cleaning detergent said to have important advantages in efficiency and economy, is a new development of the Clayton Mfg. Co., P. O. Box 550, El Monte, Calif.

Because many steam-cleaner users have available an industrial water supply of 10 grains or less in hardness, Clayton has developed K-10 compound to condition 10-grain water while providing the same cleaning action as other Clayton compounds capable of handling 20-grain water. A further production economy has been achieved by packaging K-10 in one size only—the 400-pound drum.

For further information write to the company, or use the Request Card at page 18. Circle No. 158.

Data on hydraulic booms

■ A complete line of hydraulic booms for use in the construction industry is described in a bulletin from Ingersoll-Rand Co. Applications of Hydro-Booms and their reported advantages over wagon drills in construction work and over column-mounted drills in tunneling operations are discussed.

Illustrated are booms mounted on tractors, tunnel jumbos, and self-propelled air-operated rigs, as well as a four-boom self-propelled machine for drilling a face 40 feet high underground.

To obtain Form 4162 write to Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 157.

Re-usable anchor

■ An illustrated wall chart entitled "Do's and Don't's for the use of Steelcase Strand-vise"—a re-usable anchor to hold steel strands or rods under tension during the manufacturing process—is available from the manufacturer, Reliable Electric Co.

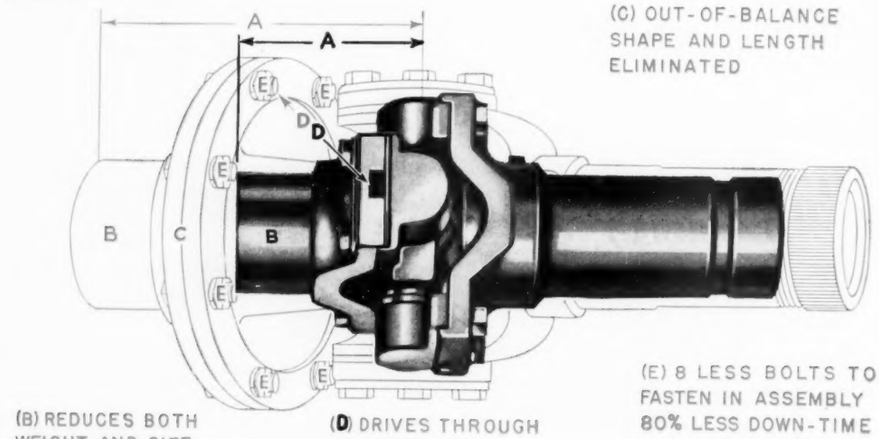
To obtain this chart write to the company at 3145 Carroll Ave., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 170.

Seaman-Andwall purchase

Seaman-Andwall Corp., Milwaukee, Wis., has bought the line of cement and materials spreaders formerly made by Century Engineering Co., Waukesha, Wis., and will make and sell the units, along with its own Pulvi-Mixers and steel-wheel and pneumatic rollers.

You Are PAYING For MECHANICS JOINTS

Every time you use a joint that requires unnecessary attachments and extra assembly time and labor, you are paying for MECHANICS advantages — but are not getting the benefit of them. You force your truck or other product to carry unnecessary DEADWEIGHT instead of PAYLOAD. And don't settle for


(A) BRINGS BEARINGS IN THE JOINT CLOSER TO BEARINGS IN TRANSMISSION AND AXLE
A
A
(C) OUT-OF-BALANCE SHAPE AND LENGTH ELIMINATED
E
D
B
C
(B) REDUCES BOTH WEIGHT AND SIZE BY ELIMINATING THE FLANGE
(D) DRIVES THROUGH KEYS-FOR SAFETY AND LONGER LIFE
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"Mechanics TYPE" — joints — let our engineers explain how genuine MECHANICS joints will give your product competitive advantages.

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Why Not Give YOUR Truck MECHANICS Advantages?

MECHANICS
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UNIVERSAL JOINTS
For Cars • Trucks • Busses and Industrial Equipment

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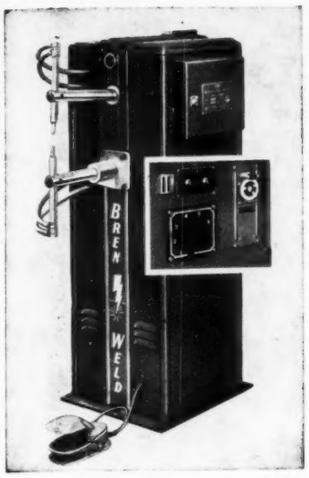

The Kasson Bren Weld SP-100 welder. Insert shows control panel.

AN INTERNATIONAL TD-9 with swing crane removes temporary wellpoints during foundation excavation for the new Buffalo Branch of the Federal Reserve Bank of New York. Because of the high water table only 10 feet below ground level, the new branch is literally being erected on a boat, and all water had to be pumped out of the ground to a depth of 30 feet in order to create a dry-dock. William L. Crow Construction Co., New York, N. Y., contractor on the job, drove 180 wellpoints to a depth of 30 or 40 feet and spaced about 6 feet apart around the perimeter of the excavation. The wellpoints were connected by 1,000 feet of 8-inch pipe, and an 8-inch pump worked 24 hours a day to keep the soil dry.

Economy is feature of heavy-duty welder

■ A 10-kva, air-operated, fully-automatic spot welder priced in a class with standard 5-kva units is being marketed by the Kasson Die & Motor Corp.

The Bren/Weld SP-100 spot welder is said to be the first unit of its type to feature an efficiency-increasing toroidal transformer. It can weld two pieces of ⅛-inch steel.

The new machine has a welded structural steel frame enclosed in a heavy-gage steel case, and features a heavy-duty double-acting air cylinder with adjustable speed control in both directions. Controls are mounted on a single side panel for convenience. A self-compensating pressure switch eliminates the need for adjustments when air pressure is changed.

For further information write to the Kasson Die & Motor Corp., 32-14 Northern Blvd., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 145.

Lift-Slab construction

■ Statistics from 30 states and three foreign countries on the savings said to result from Lift Slab construction are contained in a brochure from United States Lift Slab Corp. The number of projects, square feet involved, and other pertinent facts are included. Photographs illustrate the construction features.

To obtain this brochure write to the United States Lift Slab Corp., Perry-Brooks Bldg., Austin, Texas, or use the Request Card at page 18. Circle No. 180.

Sprayers and dusters

■ The Hudson Mfg. Co.'s complete line of sprayers and dusters for the construction industry is contained in a 42-page liberally illustrated catalog. Various uses, specifications, and an extensive line of accessories and service parts are listed.

To obtain Catalog No. 491 write to the H. D. Hudson Mfg. Co., 589 E. Illinois St., Chicago 11, Ill., or use the Request Card at page 18. Circle No. 173.

Your MARION DISTRIBUTOR is the Man to see to GET SET NOW! for Tough Jobs Ahead

THIS KING SIZE COUPON WILL BRING YOU THE FACTS!

MACHINE	SHOVEL CAP. CU. YD.	SHOVEL BOOM LENGTH (EFF.)	HANDLE LENGTH (OVERALL)	MAX. CRANE BOOM LENGTH	MAX. CRANE RATING IN TONS @12' RAD. EXCEPT AS NOTED CRAWLER	TRUCK	WAGON	HOE CAP. CU. YDS.	ASK FOR BULLETIN NUMBER
MARION 32-M	¾	19'-6"	16'-4"	80'-0"	*17½	*25	*25	¾	416
MARION 43-M	1	22'-6"	16'-4"	100'-0"	*27	*35	—	1–1¼	415
MARION 362	1½	24'-8"	18'-2"	100'-0"	37	—	—	1½–2	398-D
MARION 372	—	—	—	100'-0"	43	—	—	—	—
MARION 83-M	2	24'-8"	18'-2"	120'-0"	60	—	—	2–2¼	414
MARION 87-M	—	—	—	140'-0"	75	—	—	—	—
MARION 93-M	2½	27'-4"	20'-0"	120'-0"	80	—	—	—	397-E
MARION 101-M	3	27'-4"	20'-0"	120'-0"	84	—	—	—	417
MARION 111-M	4	32'-0"	23'-8"	120'-0"	169	—	—	—	402-B

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P.S. The best time to get set is NOW, Today!

MARION POWER SHOVEL COMPANY
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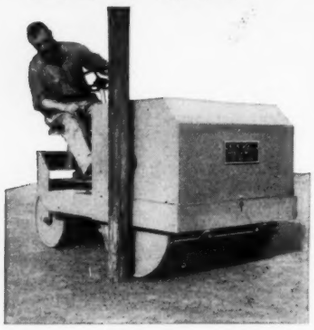
THE **KEN ROLL**



Works within ½" of wall or post—eliminates much costly hand tamping

Handiest 1½ ton roller ever built

Weighs 1600 pounds empty and over 3,000 pounds with water ballast. Compacts to within ½" of wall on right side. Drive roll 30½" dia. x 36" wide. Split steering roll 20½" dia. x 30" wide. Single lever controls forward and reverse motion through constant mesh transmission—insuring smooth starts.

Contractors enthusiastic about economy and are coming back for more. Low, modern trailer available for hauling.

Write for detailed specifications and price!

PFAHLER MANUFACTURING CO.
GALION 1, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 298

ROSCO'S PRESSURE METERING MAKES THE DIFFERENCE AT ANY WIDTH!

Do you know . . .

that it's possible to apply bitumen through any length of spraybar from 1 to 24 feet *without changing the pressure and without any application adjustment?* It can be done with a Rosco! You would normally expect surges or drops in pressure to occur when sections of a distributor's spraybar are shut-off or turned on.

But . . .

NOT with a Rosco Distributor equipped with exclusive Pressure Metering. Even when as much as 23 feet of a 24-foot spraybar are shut-off, the precise, accurate delivery remains unaffected . . . the pressure in the working one foot stays the same as it was pre-set at the beginning of the run. The accurate delivery from the working nozzles is not affected . . . no matter how many feet of the bar are cut out.

No adjustments in truck or pump speed are required—in fact, with Pressure Metering the pump speed never changes and normal wear of the pump never affects the accuracy of the application. When any part of the spraybar is shut off, the excess material is automatically by-passed. Pressure at the operating nozzles stays the same. When additional nozzles are turned on, pressure is immediately available to supply them.

One control sets the pressure specified for the job. After that, pressure control is automatic . . . the operator can concentrate full attention to spotting the material properly on the road. Pressure Metering is an integral part of Rosco's patented Master Valve that permits one-lever control of all normal distributor functions. You'll find that Rosco's Pressure Metering is faster and more accurate —factors which can be the difference between a "make" or "break" job in today's highly competitive field. And Rosco's Pressure Metering assures you of jobs that will always meet rigid application specifications.

Let your Rosco dealer show you how Pressure Metering will pay off for you. Or write the factory for descriptive literature with specifications on Pressure Metering-equipped Distributors.

ROSCO BITUMINOUS DISTRIBUTOR with Pressure Metering. Front or rear mounted for truck or trailer.

ROSCO MINNEAPOLIS 3118 SNELLING AVENUE • MINNEAPOLIS 6, MINNESOTA
DISTRIBUTORS • MAINTAINERS • BROOMS
SUPPLY TANKS • TAR KETTLES • STREET FLUSHERS

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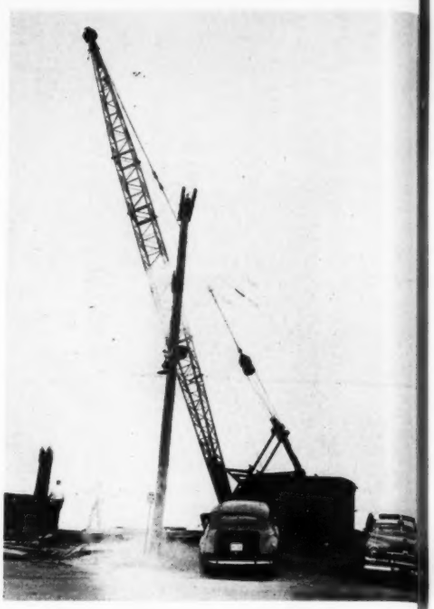

A McKiernan-Terry steam hammer handled by a Koehring 605 crane with 90-foot boom drives interlocking sheet piling for the seawall.
C&E Staff Photo

Seawall and hydraulic fill check

Two sections compose 7,100-foot seawall length; divided highway with parking area completes job

Further erosion of New Hampshire's Hampton Beach by the Atlantic Ocean is being checked by a new 7,100-foot seawall composed of 3,900-foot and 3,200-foot sections, the latter built of two types of protective walls.

The shorter section, extending from Highland Avenue to a point just south of Great Boar's Head, consists of a wall of inter-locking sheet piling completely covered with a thick concrete face, and a gravity type wall, used wherever rock was encountered. In the completed structure, both walls look identical because only the front face and the cap are exposed. The second section, 3,900 feet long, runs from the north side of Great Boar's Head to connect with an existing seawall.

Massachusetts Northern Construction Corp., Lawrence, Mass., started work on this $676,000 project last April and completed the job in October. Still to be completed is the construction of a four-lane divided highway, which will be done under a separate contract.

The 3,900-foot seawall section north of Great Boar's Head is made up of 25-foot-long Z-type steel sheeting

PICK A MONEY MAKER!

When you're buying a dragline bucket for your next job, keep in mind three important qualifications. First, Digging Ability . . . second, Long Life . . . third, Low Repair Expense. For more than forty-five years Omaha Dragline Buckets have passed these tests in actual work done on the job. Write for catalog giving specifications of 4 available types.

OMAHA DRAGLINE BUCKETS

DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

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topped with a channel cap to form the curb of a proposed roadway.

Approximately 4,240,000 pounds of sheet piling, furnished by Bethlehem Steel Co., Bethlehem, Pa., and U. S. Steel Corp., New York, N. Y., was shipped by rail to Hampton, two miles south of Hampton Beach, and delivered to the site by trailer trucks. A Lorain Moto-Crane handled the unloading. Interlocking sheets, 19 feet long and 16 inches wide, were driven to a 3½-ton bearing by a McKiernan-Terry steam hammer mounted on a Koehring 605 crane with a 90-foot boom. Steam is supplied by a McKiernan-Clayton 135-hp steam boiler. The average penetration to obtain this bearing was 10 feet.

A row of deadman piling—16-foot-long Z-type sheet piles—was driven along a parallel plane 18 feet to the rear of the seawall at intervals of 15 feet. The seawall is fastened to the deadmen by four 1½-inch tierods at every 48-foot section—the length of consecutive pours. Tops of deadmen piles, cut off at an elevation 3½ feet below the sheet piling of the seawall, will be backfilled later.

A reinforcing of ½-inch rounds was welded to the sheeting. A 6-inch-thick concrete envelope protects the exposed sheeting along the ocean side. An 18-inch-wide concrete cap drops down 4½ feet on the land side of the sheeting. Ready-mix Class A 3-inch-slump concrete was then placed into the prefabricated face form by the Lorain Moto-Crane, this time equipped with a 1-yard bucket. Approximately 2,500 cubic yards of ready-mix concrete, containing air-entraining cement, was needed for this project. The concrete was then water-cured for 7 days, and forms were stripped after 24 hours. Placing

(Concluded on next page)

c fieck beach erosion

The seawall is secured to deadmen of Z-type piling, 18 feet to the rear of the seawall sheeting, by 1½-inch tierods 15 feet apart. Tops of the deadmen will be cut off and the area backfilled later.
C&E Staff Photo

White

PORTABLE ASPHALT PLANT

MODEL L-8, 10-15 TON CAPACITY

Stationary Plants L-12 and L-25, 15-30 ton capacity.

A COMPLETE ASPHALT PLANT ON ONE CHASSIS . . . DRYER, MIXER, HEATING KETTLE. Low in cost, small enough to tow, BIG enough to produce HOT mix, (or any other bituminous mix) for driveways, parking lots, street maintenance, etc. Equipped with 50 HP LeRoi engine, air operated gates for *one* man control, divided compartment, reciprocating feeder for proportioning aggregate. Available as stationary plant with 30 HP electric motor.

Write for catalog and name of nearest dealer.

White MANUFACTURING COMPANY

ELKHART 9, INDIANA

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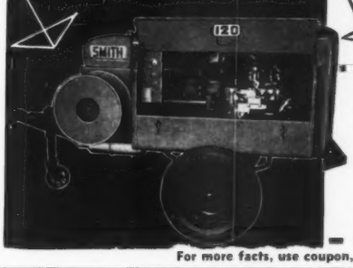
save ON YOUR COMPRESSED AIR JOBS!

USE THE SMITH 120-P COMPRESSOR



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Be thrifty . . . *save* your big compressors for *big* jobs . . . then use the Smith 120-P for the majority of your compressor work. Heavy-duty Chrysler engine has 413 cu. in. displacement. Simple, compact compressor design—no coupling or clutch. Compressor pistons operate at 120° apart for smooth, even flow of air. Corrosion-free manganese bronze compressor valves with stainless steel discs. Finned aftercooler reduces air temperature approx. 200°, gives longer hose life!

. . . Also the Smith 75-P Compressor

MAIL COUPON FOR COMPLETE FACTS

GORDON SMITH & COMPANY, Inc.
483 College St., Bowling Green, Ky.
Send latest literature, prices on Smith 120-P and 75-P compressors.

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For more facts, use coupon, or circle No. 302

TO ERECT STEEL FASTER, BETTER

USE HIGH-STRENGTH BOLTS AND MIL-CARB® CARBURIZED WASHERS

BOLT . . . instead of *rivet*. Authorities on Structural Steel Framing Practice say it's stronger, faster, and costs less to BOLT!

BOLT, and save time, erecting buildings or bridges. With modern MIL-CARB carburized washers on high tensile steel bolts you can torque up greater clamping force than is produced by the cooling of rivets. Bolts of same diameter as rivets can be used . . . bolts that have greater strength than comparable rivets . . . bolts that do not demand "scarce" field riveters in structural practice . . . bolts that produce *high strength joints* with 25% greater fatigue resistance than comparable rivet-joints . . . bolts that permit QUIET construction, free from the jarring rat-a-tat-tat of riveting . . . bolts that lower the cost of structural steel jointing that is better in every way!

BOLT your way to bigger profits. Remember, of course, that *no* bolt is any better than its washers . . . and remember, too, that only Prime Carburizing-Quality Special-Soundness Steel is used in MIL-CARB Washers, insuring uniform quality control always equal to the rigid specifications (ASTM Designation A325), applying to nuts, bolts and washers.

MAY WE HELP YOU?

If you have a specific question or a problem pertaining to washers, we shall be glad to give you the benefit of our experience.

Remember: "NO BOLT IS ANY BETTER THAN ITS WASHERS"

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MILWAUKEE WROT WASHERS

Since 1887

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The World's Largest Producer of Washers

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A Lorain Moto-Crane lowers face forms for the 6-inch concrete envelope being placed on the ocean side of the sheeting. The crane operates in the area that will be backfilled to form the subbase of a four-lane divided highway.

C&E Staff Photo

(Continued from preceding page)

and stripping of the plywood forms was also handled by the Lorain.

The required 576-foot gravity wall has an 18-inch-wide cap, as does the sheeting, running the length of the gravity structures. When backfilled to form the subbase of the roadway, the cap will become the road curb.

Concrete steps spaced along the seawall will allow bathers to enter the beach.

Other phases of project

The North Atlantic Dredging Co., Boston, Mass., started placing approximately 300,000 cubic yards of hydraulic fill on the existing beach last August and completed the job in November. This will widen and lengthen the beach and also provide a more suitable sand than already exists. The contract price for this separate phase is about $450,000.

Route 1A, which runs on the land side of the seawall, will be widened to a four-lane divided highway consisting of two 22-foot asphaltic-concrete roadways separated by a 53-foot median which will be used as a parking area. Work on this phase of the project has been let to R. G. Watkins & Sons, Inc., Amesbury, Mass., under a $425,000 contract scheduled for completion by July.

Personnel

C. E. Gilman, resident engineer for the New Hampshire Department of Public Works, supervised all three phases of the restoration work. Paul Fortuna was superintendent for the Massachusetts Northern Construction Corp. on this project. THE END

Publish new book showing architect's detail sheets

A selection of 96 specially prepared scale drawings of building components, together with photographs of the completed structures, has been published in the second series of "Architect's Detail Sheets" by the Philosophical Library, Inc. The material has been selected to show a combination of good construction and satisfactory appearance in structures of various kinds. Altogether, the work of nearly 70 designers, drawn from many countries, is represented.

As in the first selection of detailed drawings from *The Architect and Building News*, published in 1952, the examples are arranged in groupings. Portions of the book are given over to balconies, entrances and shop fronts, fireplaces, fittings for various rooms, staircases, wall details, window, and miscellaneous structures. Each of the architect's drawings is accompanied by a photograph of the completed structure on the facing page.

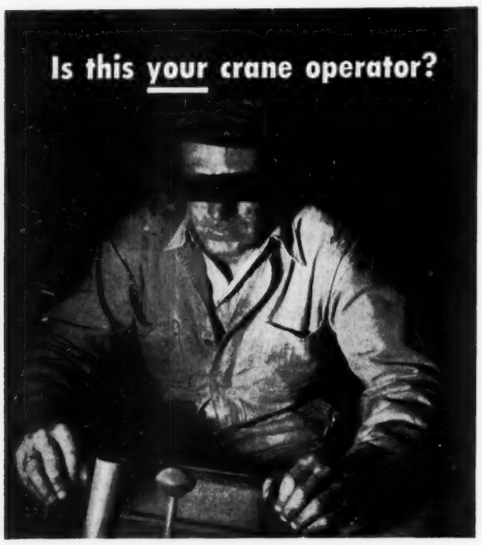
An English-French-German-Spanish glossary of technical terms used in the text is included in the book for the benefit of foreign readers. Copies are priced at $12 and may be ordered from Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y.

New reference studies construction legal cases

A new reference book from McGraw-Hill Book Co., "Legal Cases for Contractors, Architects, and Engineers" covers 52 situations in which legal advice might be necessary for those engaged in any of these three fields. Recent cases covering the subjects discussed are included to illustrate the problems presented.

All cases cited are true. The text is so written that it can be understood easily by the layman, and careful indexing makes it easy to use.

Not intended as a substitute for expert legal advice, the text is priced at $6 and may be obtained through the publisher at 330 W. 42nd St., New York.



It might well be, if he lifts heavy loads by sheer guesswork — that is, without a

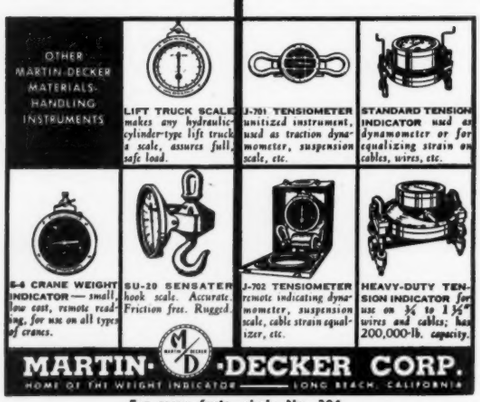
MARTIN-DECKER CRANE WEIGHT INDICATOR

The SB-10 Crane Weight Indicator warns your operator of an excessive load before he actually lifts it. Stops overtaxing equipment. Prevents costly accidents.

Merely by glancing at a dial a few inches from his controls, your operator instantly knows the weight, the boom radius, and the lifting capacity. He can tally weights while he's loading.

There are models for all crane capacities. For further information write Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., Dept. X-10.

The Martin-Decker SB-10 Crane Weight Indicator tells you (1) the weight you are lifting, (2) the boom radius, and (3) the lifting capacity at that radius.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STANDARD TENSION INDICATOR used as dynamometer or for equalizing strain on cables, wires, etc.
6-6 CRANE WEIGHT INDICATOR — small, low cost, remote reading, for use on all types of cranes.
SU-20 SENSATER hook scale. Accurate. Friction free. Rugged.
J-702 TENSIOMETER remote indicating dynamometer, suspension scale, cable strain equalizer, etc.
HEAVY-DUTY TENSION INDICATOR for use on ¾ to 1 ½" wires and cables; has 200,000-lb. capacity.
MARTIN-DECKER CORP.
HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

For more facts, circle No. 304

FIRST TRULY PORTABLE 200 AMP. ARC WELDER

Weighs only 65 lbs.; carry it to the job!

WELDS 2 PIECES OF 1½ in. STEEL!

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MODEL 200 AW

Featuring the new

TRANSOIDAL

(A development of the toroidal coil)

TRANSFORMER

(Fully protected by patent applications)

Obsoletes All Other Welders of Comparable Rating!

The portable BREN/WELD does the work of conventional welders 4 to 5 times its size and weight. Eliminates the necessity to transport bulky equipment or heavy parts to be welded.

BREN/WELD handles electrodes from 5/32" through 3/32"; it has adjustable arc voltage for various arc characteristics.

BREN/WELD is ideal for plant production and maintenance, construction work, railroads, on the farm and in home workshops.

24 HOURS DELIVERY FROM STOCK!

Comes complete with 2-10 ft. cables, ground clamp and electrode holder.

● 200 Amp.—At 50% Duty Cycle ● 110/220 Volts A.C., 50/60 Cycles ● Also Available For 220/440 Volts ● Simple To Use—Fully Guaranteed ● Has An 80% Power Factor.

11" x 12" x 7½"

List Price **$169.50**

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Lowest Price on Market for Comparable Ampere Rating

FREE! For details of free trial offer and folder see your dealer or write directly.

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screws— studs— bolts— FAILING!

Heli-Coil* Shop-packs give threaded holes positive protection against stripping, seizing, galling, corrosion. They make on-the-spot repairs.

Just drill out old fastening and/or female thread, retap with *Heli-Coil* Tap, wind in *Heli-Coil* Insert. In seconds, for pennies, you have original size, better-than-new threads.

Heli-Coil Inserts are made of diamond-shaped, coiled, stainless steel wire. They eliminate plugging, welding, going to larger bolts or studs. Many maintenance men install *Heli-Coil* Inserts at wear points on new equipment during first overhaul to prevent expensive downtime later.

Your distributor can supply you with handy Shop-pack Kits for repairing thread sizes 6-32 to 1½-6 NC and 6-40 to ½-20 NF. (Available also for 14 mm spark plug threads.)

Write today for the name of your nearest distributor, and free booklet "24 Happy Maintenance Men." 3058

*Reg. U. S. Pat. Off.

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Please send Shop-pack Bulletin No. 724A.

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COMPANY_____

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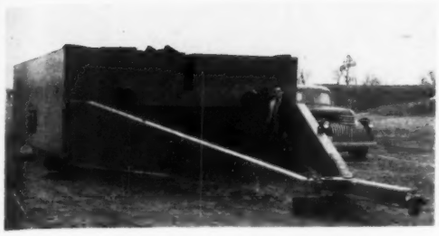

The Model 200 Super-Compactor provides compaction weight ranging from 40 to 200 tons.

Line of compaction units offers wide weight range

■ A line of heavy-duty compaction units providing weights ranging from 10 to 200 tons is manufactured by Super-Compactors, Inc. Enlarged ballast capacity is one of the important features of this line.

The Super-Compactor Model 200, which may be used for compaction needs varying from 40 to 200 tons, provides 3,120 pounds maximum pressure per inch of tire-tread width. The over-all length of 44 feet 4 inches includes a 22-foot 8-inch tongue; width is 15 feet 2 inches; and height is 7 feet 7 inches. Described by the manufacturer as "the heaviest thing on tires", this compactor rides on four 30:00 × 33 tires.

Other units in the Super-Compactor line are the Model 100, which has a load capacity of from 16 to 100 tons and provides 2,180 pounds maximum pressure per inch of tire-tread width, and the Model 50, rated at 10 to 60 pounds and at 1,675 pounds maximum pressure per inch of tire-tread width.

All of the models feature vertical wheel oscillation.

For further information write to Super-Compactors, Inc., 518 Ninth St., Sacramento 14, Calif., or use the Request Card at page 18. Circle No. 150.

A 1901 law forbade driving over 12 mph in cities or 15 in the country.

New building encyclopedia

A new reference work, "The Modern Building Encyclopedia", has been published by the Philosophical Library, 15 E. 40th St., New York, N. Y., covers 4,000 individual terms used in the theory and practice of modern building. Designed to answer the needs of the contractor, the craftsman, the student, and the apprentice, the text gives wide and inclusive definitions. Cross-references are given where necessary.

The book contains over 800 specially prepared drawings to illustrate the definitions.

Edited by N. W. Kay, the book contains 768 pages and may be ordered through the publisher at a cost of $15 per copy.

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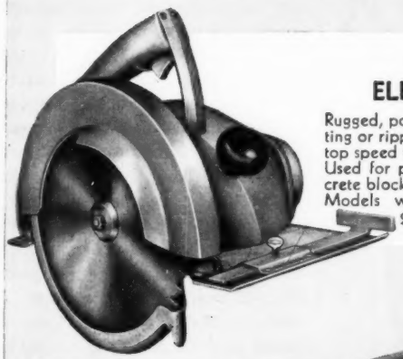

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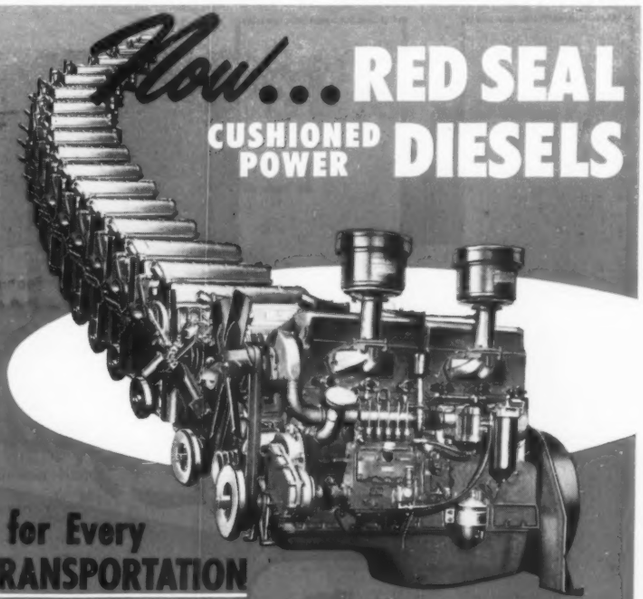

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ZD129	4	3¼ x 3⅞	129	34.0 @ 2000	87.5 @ 1200
GD137	4	3⅛ x 4⅜	157	39.0 @ 2000	113.3 @ 1200
ED201	4	3⅛ x 4½	201	42.8 @ 2000	143.0 @ 1100
HD243	4	3⅜ x 5½	243	54.7 @ 2000	178.0 @ 1200
HD260	4	3⅛ x 5½	260	59.3 @ 2000	188.0 @ 1100
HD277	4	4 x 5½	277	63.0 @ 2000	201.0 @ 1100
JD382	4	4½ x 6	382	72.5 @ 1600	276.0 @ 1000
TD427	6	4⅛ x 4⅜	427	106.5 @ 2000	310.0 @ 1200
RD572	6	4⅛ x 5⅛	572	134.0 @ 2000	428.0 @ 1300
VD603	8	4⅛ x 4⅛	603	175.0 @ 2600	468.0 @ 1200
SD802	6	5⅛ x 5½	802	202.0 @ 1800	620.0 @ 1200

TRANSPORTATION

MODEL	CYL.	BORE & STROKE	DISPLACEMENT	HP @ GOV. SPEED	MAX. TORQUE @ RPM
TD6427	6	4⅛ x 4⅜	427	116.0 @ 2400	307.0 @ 1200
RD6572	6	4⅛ x 5⅛	572	172.0 @ 2400	428.0 @ 1300
VD8603	8	4⅛ x 4⅛	603	182.0 @ 2800	466.0 @ 1200
SD4802	6	5⅛ x 5½	802	225.0 @ 2200	620.0 @ 1200

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Excavation of deep peat and muck swamps, required in two sections, is done by a Lorain 79 crane with Page 1½-yard clamshell, as a fleet of dump trucks brings sand which the Cat D8 pushes into the hole as backfill. Trucks provide all the compaction needed on the fill. *C&E Staff Photos*

Sand and clay borrow grade new expressway

Building the grade for the Detroit-Toledo Expressway, Michigan's newest toll-free superhighway running approximately 30 miles to link the busy industrial cities of Michigan and Ohio, was largely a matter of finding and hauling large quantities of sand and clay to make the many bridge approach fills and to grade the roadway up above the surrounding flat countryside.

In this congested southeastern corner of the state, the new expressway —financed by bonds which will be retired over a period of 20 years—will supplement the Detroit Industrial Expressway connecting Detroit and Willow Run, and the John C. Lodge and Edsel Ford Expressways in the city of Detroit.

Although it parallels two existing routes closely, the limited-access road is being constructed on an entirely new alignment. Grade-separation structures are being erected at the crossings of all roads and railroads, allowing room for future widening. The cross section of the right-of-way differs from place to place to suit local conditions, but a fairly typical section includes two 24-foot roadways of 10-inch reinforced concrete, with 10-foot shoulders on each side and a 16-foot depressed median between. From the outer edge of the shoulders, the grade slopes at a 4 to 1 slope to wide flat ditches. The right-of-way is 300 feet wide, so that another 12-foot-wide lane can be added to the roadway in the future. The grading section is topped with a sand subbase 16 inches thick, which extends across the outer shoulder to the slope line. Two lines of 6-inch open-joint sewer drain subbase are adjacent to the median strip.

Big earthwork job

All along the road, contractors generally had to scour the countryside for fill material, taking advantage of every available source within four to five miles of the right-of-way to secure sufficient amounts of borrow. On one 9.2-mile section near the Ohio line, built by Louis Garavaglia, Center Line, Mich., more than two-thirds of the earthwork quantity was borrow, and most of this was secured from pits several miles from the highway. The extent of this firm's hauling operation is evident from the contract quantities: 1,546,000 cubic yards of earth excavation and 2,433,000 cubic-yard-miles of overhaul—more than a mile and a half of overhaul for each yard of dirt.

Garavaglia used his own extensive equipment fleet on this work, and sublet a few parts of the job. Clearing and grubbing, done by L. & L. Tree Removal Co., Decatur, Mich., involved cutting through groves which had surrounded old homes. Large elm, maple, and cottonwood trees were cut

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A TYPE FOR EVERY DIGGING PURPOSE

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An Allis-Chalmers HD-19 tractor pulls a Gar Wood 23-yard scraper making a ditch excavation on the expressway with the aid of a Caterpillar D8 push tractor. Scrapers make the first cuts, building as much fill as the cuts can supply.

with chain saws, and their stumps and the smaller trees and brush were grubbed with Cat tractor-dozers.

On most of this job, a spread of tractor-drawn scrapers stripped the topsoil and started grading the section. Since most of the balances required borrow to be hauled some distance, the tractor-scrapers just made the necessary cuts and built as much of the embankments as this material would make. Included in the scraper spread were two Allis-Chalmers HD-19 tractors, one with a Gar Wood 23-yard scraper and the other pulling a LeTourneau FP scraper. An Allis-Chalmers HD-20 tractor pulled a LeTourneau W scraper, and a Caterpillar D8 tractor was coupled to a smaller Gar Wood scraper. These four scrapers were assisted on loading cycles by a Caterpillar D8 pusher. The rigs made the ditch excavations and started the roadway fills, while a Caterpillar No. 12 motor grader shaped the sections.

Except for three locations where the fill material was hauled in by trucks, the remainder of the grading section was built by two spreads of Tournapulls which hauled from borrow pits near the right-of-way. One spread of six C Tournapulls used two Allis-Chalmers HD-19 push tractors. The other spread of four C Tournapulls was push-loaded by a single HD-19. Most of the fill hauled by these spreads was clay soil obtained from shallow borrow pits.

At times, this clay was extremely wet and sticky and very difficult to handle. On the loading cycle the clay slid along in great chunks ahead of the cutting edge of the scraper instead of filling the bowl. Once the bowl was filled with the material, it was equally difficult to empty. With the apron wide open, the clay stuck in the bowl until it was ejected in almost a solid chunk. This type of material naturally required extra manipulation on the fills so that it could be dried out, shaped, and compacted. Dozers, sheepfoot rollers, and motor graders combined efforts to finish the sections.

Trucks haul sand

The building of a large fill at a railroad overpass approach was sublet to C. L. C. Trucking, Detroit. In spite of its name, C. L. C. is more than just a trucking company, since it owns and operates a sizable spread of heavy construction equipment. On this job, two Lorain draglines, one with a 1¼-yard bucket and one with a 2½-yard bucket, were moved into a

(Continued on next page)

For more facts, circle No. 310→

Contractor's check list for specifying ASPHALT

1

CONVENIENT SHIPPING SOURCES

Standard has 5 centrally located shipping points in the Midwest:

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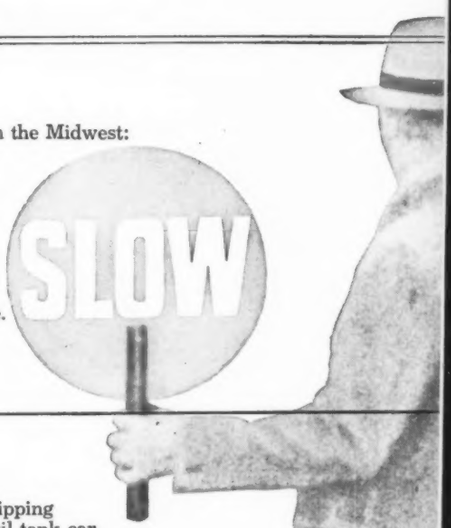
Asphalt from Standard Oil gets shipped to you direct from the shipping point nearest your job site. Shipments get to the site faster, keep you on schedule.



2

TANK CAR AND TANK TRUCK SHIPMENTS

Shipments can be made from any Standard Oil shipping point in either tank car or tank truck. Standard Oil tank car service keeps contractors supplied with asphalt at the rail head as needed. Tank truck deliveries permit shipment directly to the job site, often saving heat-up to unload, and making possible unloading directly at the batching plant.

3

RELIABLE SOURCE OF SUPPLY

A reliable source of supply means three things to a contractor:

1 A supplier that delivers according to contract *when needed.* Standard Oil recognizes this as a prime factor in contracting for asphalt, delivering as the contractor needs material.

2 A supplier familiar with the contractor's problems. Standard has been supplying asphalt to contractors in the Midwest for many years. Standard salesmen know contractor's problems . . . know how to give him service.

3 A contractor must have dependable sources of supply. Taking care of its customers through periods of short supply as well as delivering when materials are plentiful is the kind of service contractors need, want and get from Standard. With the big program of road construction now under way and promises of even bigger programs to come, an assured, dependable source of asphalt is a must for every road building contractor.

Check this list, then check with Standard. In the Midwest contact your nearby Standard Oil office. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY (Indiana)

A fleet of 12 Mack trucks with 10-yard boxes, augmented by locally hired trucks, haul material for a big fill at a railroad bridge approach. As loads are dumped, the International TD-18 in the foreground and a Cat D6, background, spread the material.

(*Continued from preceding page*)

sandy borrow pit about 4½ miles from the roadway. These machines loaded a fleet of 30 dump trucks, which included 12 of the contractor's Mack tandem-axle units with 10-yard dump boxes and an assortment of local hired trucks.

Though the 30 hauling trucks made the fill area a busy spot, a well planned operation eliminated all confusion. Trucks entered the area from one end and drove straight over the fill, spreading the loads as they dumped. Instead of turning around, they drove off the other end of the fill and went back to the borrow pit on another road. Three tractor-dozers —an International TD-18, a Caterpillar D6, and a D7—spread the loads as they were dumped into lifts of approximately one foot of loose material.

When a lift had been placed over a large area, the TD-18 tractor hooked onto a Bros 50-ton rubber-tire roller and made two or three passes over the entire area. This compacted the sand very well and left the surface so hard that trucks or automobiles could operate on it with very little penetration. Each afternoon when the trucks stopped hauling and the compaction was complete, an Austin-Western motor grader bladed the surface of the fill and the haul roads so that the truck fleet could operate with maximum efficiency the next morning. This fill was carried up to a maximum height of 28 feet above the normal ground level adjacent to the railroad crossing structure.

Peat and muck excavation

At two points in this section of the expressway, it was necessary to excavate deep peat and muck swamps and backfill with sand. These two sections, contracted for shortly after the contract was awarded, involved an additional 249,000 cubic yards of earth excavation which covered the muck excavation and clay backfill above the elevation of water, 348,600 cubic-yard-miles of overhaul, and 109,000 cubic yards of sand-gravel backfill. The backfill was used in the area where muck had been excavated to an elevation of about two feet above high-water elevation.

One of the locations where this work was done was at a bridge site on Otter Creek. Since the swamp on both sides of the stream was soft peat and muck, there was no way to get to the site of the proposed bridge until the muck had been removed and firm backfill placed.

To secure access to both ends of the site, the contractor built a sand fill completely across the creek, making a

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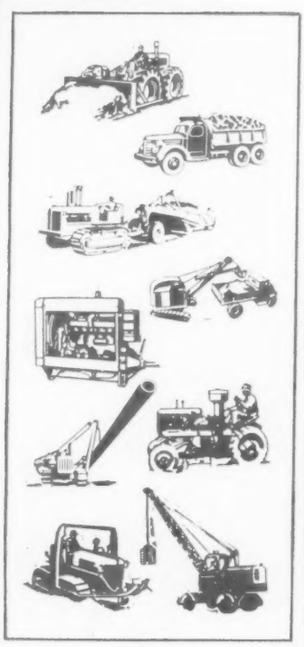

These NEW type ROCKFORD clutches have been developed and field tested by Rockford Engineers for heavy-duty clutch service. Because of their specialized characteristics, MORLIFE type ROCKFORD clutches are best suited for use in off-the-road machines such as tractors, trucks, tanks, cranes, shovels, bulldozers, earth movers, pipe layers, power units and other heavy duty equipment. For information how this NEW development will improve the operation and increase the on-the-job hours of your heavy-duty machines, write Department E.

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Most of the section is built by Tournapulls, which haul the bulk of the wet and sticky clay soil from shallow borrow pits. The clay, difficult to handle, sticks to the bowl and is ejected almost in a single chunk.

C&E Staff Photo

detour around the bridge location. Pipe culverts installed in this temporary road carried the flow of the stream during the construction period. When the bridge is complete, this fill will be removed and some of the material salvaged for the bridge-approach fills.

To excavate the unsatisfactory material in the swamps, the contractor used a Lorain 79 crane with a Page 1½-yard clamshell bucket. The crane cast the material as far as possible to the side, and a fleet of trucks started hauling sand from nearby pits to fill the excavation. As the trucks dumped the sand in piles, a Caterpillar D8 tractor-dozer pushed the material into the water, forcing any remaining peat ahead where the clamshell could get it. A local contractor and local truckers delivered the sand fill to the site.

A similar operating procedure was used by a Lorain 820 crane and a Caterpillar D8 tractor-dozer to muck out another swamp and backfill it with sand. In both cases, the excavation was carried down through the soft material to firm blue clay, and the sand fill was carried up from this base.

Miscellaneous items in this contract included the laying of 14,250 square yards of 10-inch concrete paving at the junction with U. S. 24A near the Ohio line. This provides a paved bypass for busy 24A while the permanent connection is being built. The contract also included the placing of more than 10,000 linear feet of concrete pipe culverts ranging in size from 12 to 48 inches.

Personnel

Supervising the entire project for Louis Garavaglia was Lynn J. "Bud" Vanderjagt. On the big railroad approach fill, Larry Colasanti, one of the owners of C. L. C. Trucking, stayed right on the job, supervising the work a good deal of the time. Project engineer for the Michigan State Highway Department on this section of the expressway is Edward J. McKeon. District construction engineer is E. G. Schwoppe. H. J. Rathfoot is construction engineer for the department and Charles M. Ziegler is state highway engineer. THE END

New textbook discusses steelwork construction

A clear and thorough discussion of the principles underlying the design and construction of steel frame buildings and other steel structures is given in "Construction Steelwork" by Oscar Faber.

Liberally illustrated with specially prepared drawings and supplemented by numerous drawings, the text is intended for practicing engineers and architects as well as for students.

"Constructional Steelwork," published in England, is available in this country through the Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y. It is priced at $10.

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Mixed-in-Place Piles, used as shoring, simplified the job of enlarging the Swedish Hospital, Seattle, Wash. If you are expanding your facilities, you will want to know how . . .

Mixed-in-Place Piles prevent vibration damage and settlement

A recent INTRUSION-PREPAKT development (patent applied for)—Mixed-in-Place Piles—is making it possible to solve difficult soil and foundation stabilization problems. A typical example is Seattle's Swedish Hospital where an addition required excavation close to existing buildings. Mixed-in-Place Piles permitted speedy completion of the project without damage from pile-driving vibrations, ground heaving or settlement.

Economical and easy-to-use, Mixed-in-Place Piles are placed by mixing Intrusion Grout with the soil in place. Soil is not withdrawn, but is used as the aggregate. The result is a pile-like column of considerable load-bearing capacity useful for soil stabilization, support piling, cutoff walls, underpinning and cofferdams.

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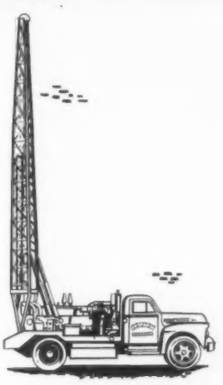
On many tough foundation problems, INTRUSION-PREPAKT's fresh approach has produced a cost-saving solution. It may on yours, too . . . so why not write on your letterhead for a brochure on our special foundation services.



All equipment for placing Mixed-in-Place Piles is truck-mounted on a single highly mobile rig. It can operate in tight spots inaccessible to pile-driving units.

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Intrusion and *Prepakt* are trade marks of Intrusion-Prepakt, Inc., whose methods and materials are covered by U. S. Patents Nos. 2313110, 2655004, 2434302 and others, also patents pending.

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On the 13-mile reconstruction of U. S. 30, Woodward Construction Co., Inc., Rock Springs, Wyo., uses a Rosco distributor on a Reo truck to apply MC-3 asphalt ahead of the chip spreader.

Chip spreader completes seven miles of work daily

In a matter of 8 hours, a contractor-built chip spreader traveled 5 miles from Green River, Wyo., as dump trucks loaded with crushed stone chips shuttled to and from the machine, enabling a contractor to complete a double-penetration asphalt-chip shoulder treatment along this stretch of U. S. 30. At the end of the working day, both sides of the road were finished.

This chip spreader, which will complete seven miles of straight seal coating 26 feet wide in a day, was developed in the home shop of Woodward Construction Co., Inc., Rock Springs, Wyo. In service, it has proved extremely practical.

Self-propelled, the machine can lay a uniform lift of rock chips up to 13 feet wide and from ¼ to 2½ inches deep. This cover can be varied to meet any specification either by a gate adjustment at the back or by a tachometer reading from the operator's position. The ample hopper capacity of the machine permits it to move down the highway while trucks are changing position. As a result, it keeps working for miles at a stretch, even on mountain grades. It stays so close to the truck during loading that the truck driver can forget about backing up when charging the hopper.

The rig, about 30 feet long over-all and 13 feet wide, is mounted on a

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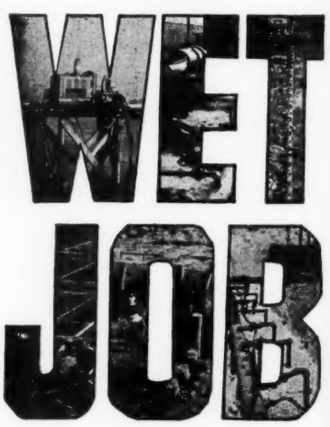

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For more facts, circle No. 316

Self-propelled 13-foot-wide rig covers 26-foot pavement in two passes, lowering costs and speeding asphalt jobs

Hooked to and towed along by the spreader, a truck dumps to the 10-ton-capacity rear hopper. Rock chips move along a 30-inch conveyor belt and drop through a 2-inch grizzly screen to the front hopper to be discharged onto the roadway.

war-surplus International halftrack chassis. It consists of front and rear feeder hoppers, totaling 10 tons in capacity, connected by a 30-inch belt conveyor. All power for the machine is furnished by an International engine.

As rock chips are dumped from a truck to the hopper at the rear of the machine, they are moved, without being segregated, to the front of the spreader. Here, they drop through a 2-inch grizzly screen which removes any pieces of sagebrush or other debris which has found its way into the chip stockpile.

After dropping through the grizzly, the material spreads uniformly over the front hopper. In this hopper there is an auger feed and a feed roller. Ordinarily, the auger is not used with dry chips.

As the machine moves down the highway, it works its chip lane from the edge of the pavement. Enough trucks are used during the operation so that at least one loaded machine is always on hand, turned around and ready to back to the rear hopper. The rig and a truck are connected in a moment as the truck reaches the hopper. This is done by a hook on the rear of the spreader, which is operated by a lever handled by a workman on the platform of the spreader.

(Concluded on next page)

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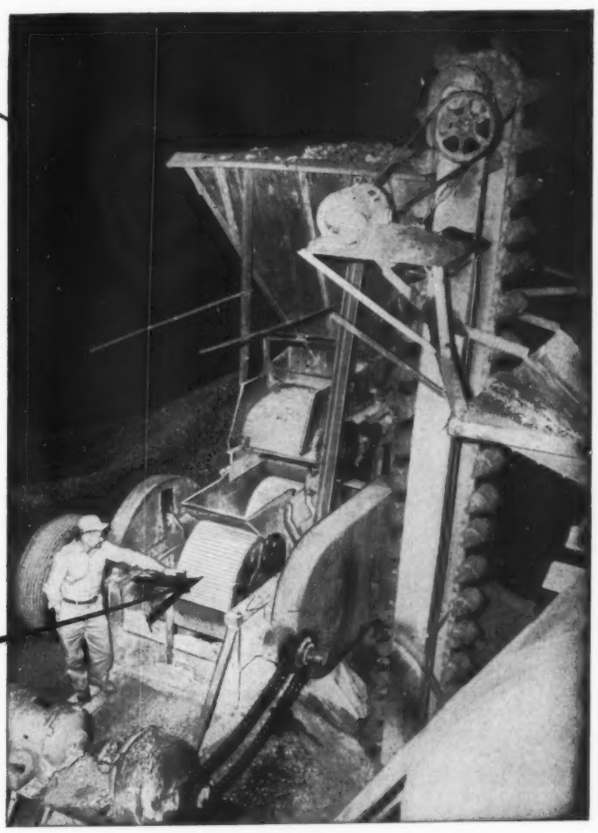
• EXACT location of buried pipes, mains, services, gates, tees, ells, stubs, etc.
• Weighs only 11 lbs. complete—one man operation!
• New electronic circuit provides strong, positive location signal.
• Uses standard miniature radio tubes and flashlight batteries.
• Lasts a lifetime—guaranteed superior performance.
Goldak Invites Comparison
Does the work of a Heavyweight
GOLDAK
Featherweight
PIPE LOCATORS
The GOLDAK Co.
Leading Makers of PIPE LOCATORS
1547 WEST GLENOAKS BLVD.
GLENDALE 1, CALIFORNIA
For more facts, circle No. 317

Crushing Life Increased 500% by **Hard-Facing** with HAYNES 90 rod



Hard-facing the rolls in this crusher rig with HAYNES 90 Rod makes them more than 5 times more durable. Two sets of rolls are used to crush rock from 3-in. down to ½-in. screen size. They handle up to 26 thousand tons of rock with a minimum of repairs—despite severe wear from abrasion and impact. Other hard-facing materials wore out before 5,000 tons of rock were crushed.

Since HAYNES 90 Rod was adopted as the standard material on this job, production increased, down-time was reduced, labor and maintenance costs were cut, and less hard-facing material was needed per ton of rock crushed. This is typical of the kind of savings that can be realized by hard-facing with HAYNES alloys.

HAYNES hard-facing alloys give outstanding service when used to protect parts in crushers, shovels, tractors, trucks, conveyors, and other metal parts exposed to wear from abrasion, impact, corrosion, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including: HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt-base rods, and HAYSTELLITE tungsten carbide tube rods. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See... Your local Haynes Stellite Dealer

or

Write... to Haynes Stellite Company

"Haynes," "Haynes Stellite," "Haystellite" are registered trade-marks of Union Carbide and Carbon Corporation.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 318

(*Continued from preceding page*)

The self-propelled spreader then pulls the truck along until the entire load has been emptied into the hopper. The connection is then quickly disengaged, the truck moves off, and another truck backs in to take its place.

Typical job is fast

Typical of its work is the spreader's recent job on the 13-mile reconstruction of U. S. 30 near Green River. This required a high-density subgrade, granular base course, plant-mix asphalt paving, an asphalt-penetration shoulder treatment, and an asphalt-chip seal coat over the plant-mix.

Shoulder specifications called for a coat of MC-O asphalt prime over the granular subbase. On top of this a shot of MC-3 was required, followed by 39 pounds of ¾-inch-minus crushed rock per square yard, another shot of MC-3, and a cover of 29 pounds of ¾-inch rock per square yard.

A Rosco pressure distributor, working at about 20 psi, applied the hot MC-3. The machine was set for 8 feet where the shoulders were that wide, and for 10 feet for the remaining shoulders. The center riding surface on this job is 28 feet wide.

Following the Rosco distributor was the contractor-built spreader. Next in line were the rollers, which worked far enough away so that they did not interfere with the trucks loading the machine. Two Galion steel-wheel machines made one pass and two Tampo pneumatics drawn by International rubber-tire tractors completed the compaction. The first lift, which used 39 pounds of material per square yard, required about 8 passes of the pneumatics to work the asphalt up so that the top of the lift showed black. Only two passes were needed on the last lift. The 13-foot-wide chipper, which covers an ordinary 26-foot pavement in two passes, completed this work on the 28-foot roadway in three passes of the equipment.

General superintendent Darrell Wagner and foreman Louis Vosika supervise the work of the machine, which is so efficient and fast that Woodward has been able to hurry its asphalt jobs to completion while lowering its chipping costs.

THE END

Issue revised standards on multiple V-belt drives

A revised 24-page manual, "Engineering Standards Multiple V-Belt Drives" has been issued jointly by Multiple V-Belt Drive & Mechanical Power Transmission Association and the Rubber Manufacturers Association, Inc.

The data indicates the proper sheaves and belts to be used for optimum efficiency and economy of the drive. There are ten pages of new horsepower ratings for standard-quality belts, and ratings of premium-quality belts appear for the first time. Ratings for belt speeds from 200 to 6,000 feet per minute are also given.

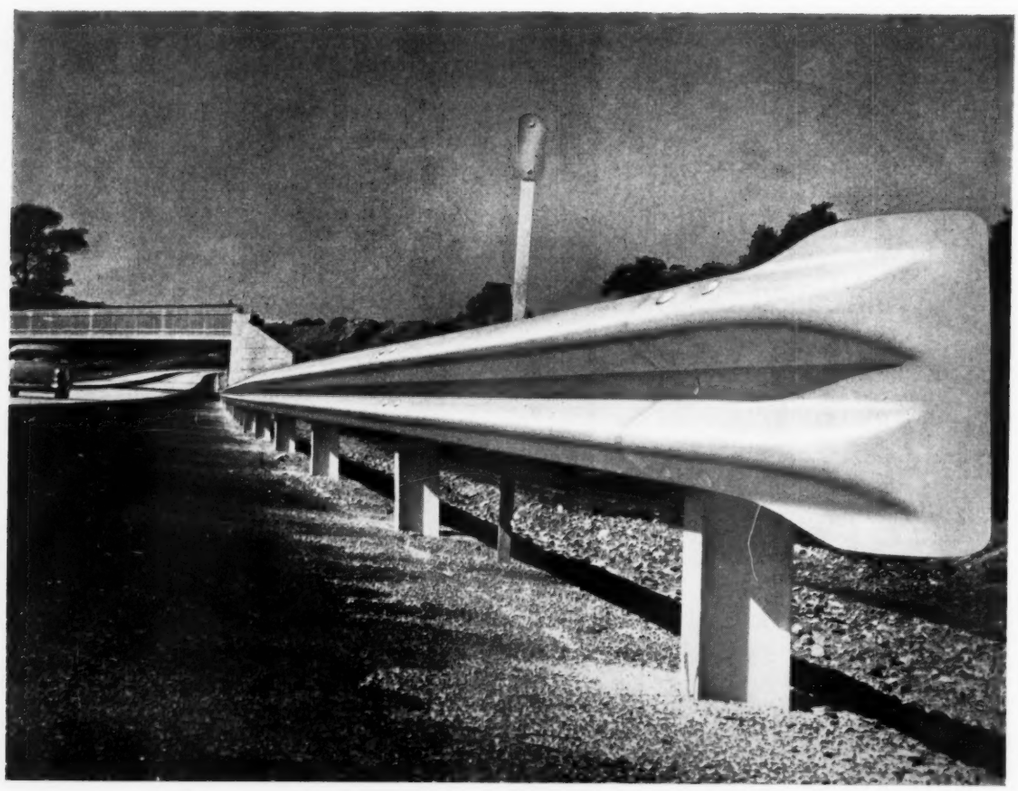
Copies of the manual may be obtained from either the Rubber Manufacturers Association, Inc., 444 Madison Ave., New York 22, N. Y., or from the Multiple V-Belt Drive & Mechanical Power Transmission Association, 27 E. Monroe St., Chicago, Ill. Copies are priced at $1 each.

New text on problems of frost penetration

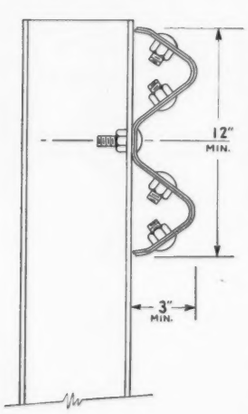
The problem of frost action in highway and airport pavements is the subject of "The Frost Penetration Problem in Highway Engineering," by Alfreds R. Jumikis, professor of civil engineering at Rutgers University.

Designed as a manual for those already engaged in frost-penetration work and also for student use, the book is liberally illustrated and contains an abundance of charts, diagrams, and formulas. The text is divided into three sections which discuss heat, temperature changes, theories that have already been advanced, and some suggested remedies for the problem.

Published by the Rutgers University Press, New Brunswick, N. J., the book is priced at $5.



INTRODUCING
Bethlehem Beam Guard Rail

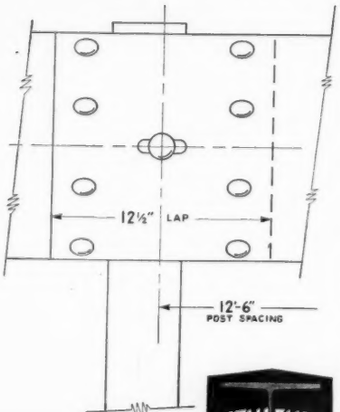


In order to meet the ever-increasing demands of the road-building industry, Bethlehem has added a new section of highway beam guard rail to its list of products. Tests show the new section, made from 10- and 12-gage steel, to be stronger than older-type sections. Erection is simplified because fewer bolts are required for permanent installation. Details and dimensions of the new section are shown at right and left.

The nearest Bethlehem sales office will be glad to supply further information about Bethlehem Beam Guard Rail.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM STEEL

BETHLEHEM STEEL

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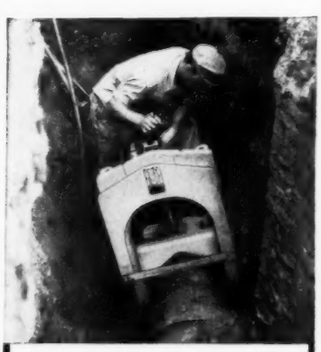

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No Flame—Safe Cuts Under Hazardous Conditions!
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Power Pipe Cutters from 2 Inch to 6 Foot Capacity
For further information write to:
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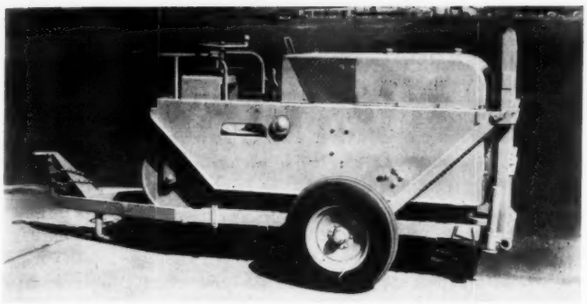

Standard Steel Works' Model 55 tandem roller provides a variable ballast arrangement for from 1½ to 2½-ton compaction.

Tandem roller provides up to 2½-ton compaction

■ Standard Steel Works, 16th and Howell, North Kansas City, Mo., has announced a tandem roller, the Model 55, featuring even distribution of ballasting in both steel and water to provide 1½ to 2½-ton compaction.

For various jobs ranging from light patching to wide-roll operation for smooth finishing, steel ballasts are removable in 70-pound sections. The machine will roll to within 2 inches of walks or other obstructions on the driver's side. Eight-inch ground clearance provides flush rolling to curbings. Over-all length is 103 inches.

Automotive steering, fingertip controls, automotive-type brake pedal, and speed controller and throttle, as well as the water valve, are easily operated from the upholstered driver's seat.

A trailer is also available for transporting the unit from job to job. According to the manufacturer, one man can easily load the roller on the ramp-type trailer and hitch the trailer to a vehicle—all within a few minutes.

For further information write to the company, or use the Request Card at page 18. Circle No. 140.

Turbodiesels

■ A 16-page-color catalog on the line of turbodiesels offered by Cummins Engine Co., Inc., Columbus, Ind., is now available. Complete data is given on the company's JT-6, NT-6, NTO-6, NRT-6, and VT-12 models, and recommended uses are given. Diagrams and charts are included.

To obtain Bulletin No. 12009 write to the company, or use the Request Card at page 18. Circle No. 172.

Traffic engineering text

A new reference book for those engaged in highway traffic planning, "Traffic Engineering", has been published by the McGraw-Hill Book Co., 330 W. 42nd St., New York, N. Y., as part of its civil engineering series.

The book brings together in one volume the general knowledge of this new phase of engineering. Although semi-technical in nature, the material covered is illustrated by charts, diagrams, and sketches for easier understanding.

Written by Theodore M. Matson, late director of the Bureau of Highway Traffic, Wilbur S. Smith, associate director, and Frederick W. Hurd, present director, the book is priced at $12.50 and may be obtained from the publisher.

Powered wheelbarrows

■ A folder from the Prime-Mover Co., Sampson St., Muscatine, Iowa, informs the general contractor of the savings said to result from the use of the company's powered wheelbarrows. Also listed are the factors involved in putting all types of buggies to use. The folder was compiled from records of the experience of contractors who use Prime-Movers.

To obtain Bulletin PMC-4 write to the company, or use the Request Card at page 18. Circle No. 193.

Direct-reading level rod

■ A recently published folder explains a new direct-reading level rod, the L-E-Vation rod, a product of the Lenker Mfg. Co. The maple rod, which comes in two sections, is 5.4 feet long when closed, and 10 feet long when extended. A 14-foot reading may be had by using a 4-foot boot or extension.

To obtain this folder write to Lenker Mfg. Co., 599 Chestnut St., Sunbury, Pa., or use the Request Card at page 18. Circle No. 199.

New thruway section opens

A 28-mile link of the New York Thruway from Suffern to Yonkers opened to traffic on December 15. This section includes the three-mile Hudson River bridge. The section, which will have three traffic lanes in both directions, brings the number of miles open to traffic to 424.

RUGGED *Humdinger* DIAPHRAGM PUMPS

MAKE TOUGH JOBS EASY

America's favorite for over 30 years

For more than a quarter-century . . . Humdinger Diaphragm Pumps have shown the way to better, more efficient handling of really tough pumping jobs. And now . . . with the development of the new Model 30 BF . . . Humdingers are better than ever! These smooth operating, workhorse pumps — representing 30 years of pump design and manufacturing "know-how" — incorporate the most desirable features in the field today . . . streamlined, unobstructed waterways; non-clogging, oversized sludge type ball valves; readily accessible, renewable valve seats; shock reducing suction chamber; spring-cushioned diaphragm connecting rod . . . plus proven dependability, backed by America's finest name in diaphragm pumps.

Available with gasoline engine or electric motor drives in 3" single; 4" single and double diaphragm units — capacities from 3000 to 17,000 G.P.H. Mounts include steel skids, steel wheels, pneumatic tires and trailer type.

A. E. D. Members
attending the 1956 Convention in Chicago
You are cordially invited to visit our headquarters in the Conrad Hilton Hotel
January 29 — February 2

Ralph B. Carter Company
201 ATLANTIC STREET, HACKENSACK, NEW JERSEY

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avoid legal pitfalls

Illegal picketing ruled unfair labor practice

THE PROBLEM: *A mining corporation hired an independent contractor for earthmoving work. The contractor employed nonunion labor. Could a union legally picket the corporation, as a means of forcing it to terminate the contract by preventing other contractors from dealing with the corporation?*

THE ANSWER: No. (National Labor Relations Board v. Denver Building & Construction Trades Council, 219 Fed. 2d 870, decided by the United States Court of Appeals, Tenth Circuit.)

The court said that, under a provision of the National Labor Relations Act, it is unlawful for a union to establish secondary boycott of this kind by picketing a neutral employer who is not a party to a labor dispute and not able to promote the union's objectives.

A similar decision was rendered by the United States Court of Appeals, Fourth Circuit, in the case of Piezonki v. National Labor Relations Board, 219 Fed. 2d 879. In that case, the court condemned as an unfair labor practice, attempts on the part of a union to compel general contractors to use union labor. Picketing of construction sites, ostensibly directed against the general contractor but actually directed against subcontractors who operated on an open-shop basis was ruled unfair. The court said: "Here the main purpose as well as the effect of the picketing was to drive employees of the union subcontractors from the job. The consequences thereof may not be avoided by . . . the fact that the ultimate purpose was to organize the workers of the general contractors at the work sites where the picketing was carried on."

Car skids on oiled road

THE PROBLEM: *Following a sign, a motorist drove upon a section of a road under construction that had been opened to traffic. She was injured when the car skidded upon the recently oiled surface which rain had made very slippery. A flagman nearby had not warned her, nor was there any warning sign. Was the road contractor liable?*

THE ANSWER: Yes. (John F. Buckner & Sons v. Allen, 272 S. W. 2d 929, decided by the Texas Court of Civil Appeals, Austin.)

Seller is liable for defective, delayed order

THE PROBLEM: *If the seller of sewer pipe knew that the buyer, a contractor, bought it to fill the requirements of a sewer-construction contract in Michigan, was he liable for the special damages resulting to the contrac-*

VACU-LUG means LOW maintenance cost! TOP QUALITY performance!

RELUG WITH VACU-LUG!

Vacu-Lug, the miracle process for renewing traction on worn tires, cuts tire maintenance in half. Yes, you save over half the cost of new tires, regardless of size when your worn ones are relugged by the famous Vacu-Lug Process.

Here is a proven method of traction restoration — tested and approved by U. S. Agr. Dept., laboratories, contractors, and municipalities. These new lugs are applied individually from crude rubber stock and are vulcanized to the tire in a huge steam chamber. What's more important, there is a shop near you ready to give instant service — to reduce down-time to a minimum.

Write for name of Vacu-Lug Shop nearest you.

VACU-LUG PROCESS — ON THE FARM OFF THE ROAD — Turns the Earth

Tears and breaks in the casing can be repaired at the same time the tires are being relugged. All repair and relugging work are completely guaranteed. Renew power loss — get Vacu-Lug now!

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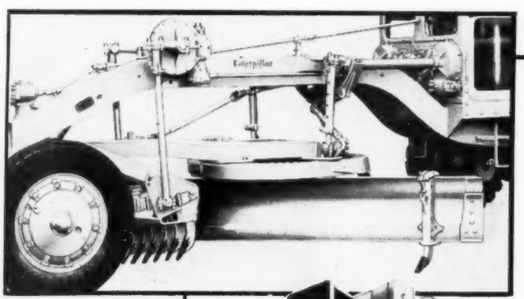

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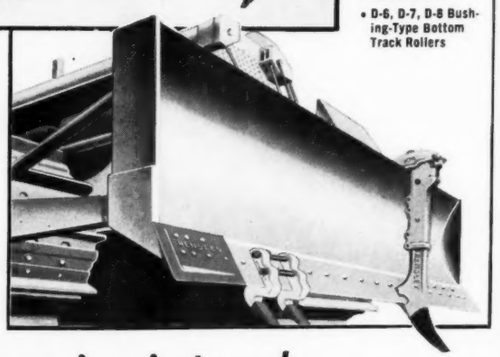
- Many Other Replacement Parts



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MONTANA:
Westate Machinery, Billings

NEVADA:
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Pioneer Equipment Co., Reno

NEW MEXICO:
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HENSLEY EQUIPMENT COMPANY, INC. — MANUFACTURERS
800 PERALTA AVENUE · SAN LEANDRO, CALIF.

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Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

tors from delayed delivery and delivery of defective pipe?

THE ANSWER: Yes. (American Vitrified Products Co. v. Wyer, 221 Fed. 2d 447, decided by the United States Court of Appeals, Sixth Circuit.)

The court said that under Michigan law, the special damages collectible by the contractor included loss of profits, overhead, cost of maintaining equipment in readiness, and cost of extra labor.

The court also decided that the contractor's acceptance of an installment of pipe from the seller after that previously delivered had been rejected by the city's engineer on the sewer project did not necessarily manifest intention to waive a claim for damages on delivery of the defective pipe that had been rejected.

Delivery of mailed letter can affect contract

THE PROBLEM: *A bidder to furnish bolts to the federal government discovered a mistake and notified the government that the bid was withdrawn. In the meantime, the government had mailed a letter not yet received by the bidder accepting the bid. Did a binding contract result?*

THE ANSWER: No. (Rhode Island Tool Co. v. United States, 128 Fed. Supp. 417, decided by the United States Court of Claims.)

The theory of this three-to-two decision by the judges of the Court of Claims is that a mailed letter is under the control of the sender until delivered and may be recalled in the meantime. The decision was partly based on the fact that the invitation for bids stated that when notice of an award should be "received" by the bidder a binding contract would result.

Rights of owner against unlicensed contractor

THE PROBLEM: *A Virginia building contract involving more than $20,000 with an unlicensed contractor was invalid. Did this prevent the owner from collecting damages from the contractor and his surety for a breach of contract as to the quality of the work—in this case breach of a waterproofing agreement?*

THE ANSWER: No. (Cohen v. Mayflower Corp., 86 S. E. 2d 860, decided by the Virginia Supreme Court of Appeals.)

The court reasoned that such statutes are designed to protect owners against irresponsible contractors and that to permit an unlicensed contractor to escape liability for his breach of the contract would be to penalize the owner.

Company liable for injury caused by careless driver

THE PROBLEM: *The driver of a heavily loaded ready-mix truck backed within two or three feet of a foundation trench on sloping wet ground. The mixer was operating at a speed that jarred the truck. Chutes on the truck made such close approach to the trench unnecessary. When the truck slipped into the trench and injured the plaintiff, an employee of the foundation contractor, was the ready-mix company liable in damages?*

THE ANSWER: Yes. (Markus v. Lake County Ready-Mix Co., 128 N. E. 2d 370, decided by the Appellate Court of Illinois, Second District.)

Subcontractor misjudged basin area to be cleared

THE PROBLEM: *A map showed the area of a reservoir basin which a subcontractor agreed to clear of trees and brush. Bidding specifications had shown that the area was about one square mile, that the area would be flagged during the bidding period, and that bidders must make their own visual observations at the site. The subcontractor's engineer knew that the flags did not delineate the whole basin area. After starting work, the subcontractor discovered that he had underestimated the area, and proceeded on an agreement that it would be without prejudice to right to assert a claim for extra pay. The prime contractor refused to recognize the claim. Was the claim valid?*

THE ANSWER: No. (Van Meter v. Bent Construction Co., 286 Pac. 2d 430, decided by the California District Court of Appeal, Fourth District, San Diego.)

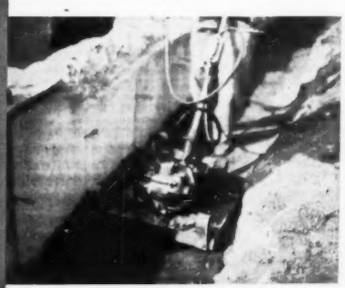
Rejecting argument that the general contractor was enriched through the subcontractor's mistake, the

10 LEADS TO BETTER, FASTER RESULTS and BIGGER PROFITS!

MACADAM DENSIFICATION. The Jackson Multiple Compactor consolidates granular soil subbases and base courses of sand, gravel, rock or slag in half the time required with equipment of other types.

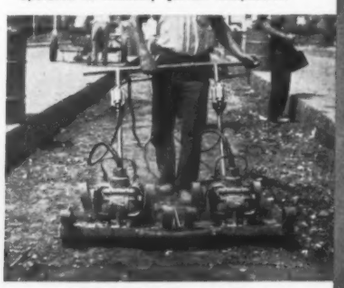
PAVEMENT WIDENING. The Multiple Compactor can be quickly converted to provide in ONE PASS 100% of required density in granular soil sub-bases and rock courses in any widening project.

GRANULAR SOIL FILLS. The Multiple Compactor quickly achieves specified density, gets into places bigger, more expensive equipment cannot reach. Individual units can be detached, operated as manually guided compactors.

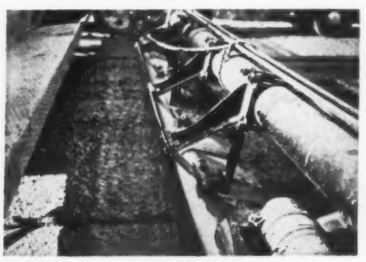


SOIL COMPACTION. Self-propelling, the JACKSON COMPACTOR, with 12" to 26" interchangeable bases, achieves specified density of granular soils in 8" to 10" depths at 2000 sq. ft. per hr. Perfect for bridge and pipe line fills, concrete floor sub-bases, etc.

BLACKTOP WIDENING & PATCHING. The same machine operated from power plant on auto-trailer with pickup for Compactor is most efficient means of blacktop pavement patching, paving walks, drives, etc. Will compact up to 2000 sq. ft. per hr. close to maximum density.



TWIN-UNITS — ONE OPERATOR. With a two-unit, side-by-side or tandem hookup of JACKSON COMPACTORS, one man can readily do the work of two, since the compactors are self-propelling and he has only to guide them.



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INTERNAL TYPE; super-powered, gives full width internal vibration through full depth of very thick slabs. Saves time, cement; provides greater density and compressive strength. Attaches to finisher or spreader.

SURFACE TYPE; does perfect job of vibrating all mixes in depths used on highway projects. The owner of a JACKSON Paving Tube can quickly switch from internal to external vibration, or vice versa, at minimum expense.

MUNICIPAL PAVING: This vibratory screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around obstructions, is rolled back for second passes on 4 rollers. Most productive and convenient screed made.

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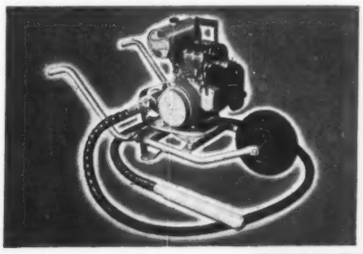
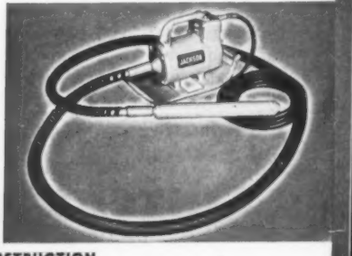
LUDINGTON, MICHIGAN





GENERAL CONSTRUCTION

(Left); 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right); 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.

avoid legal pitfalls

court said that it could not relieve the latter from the loss resulting from a one-sided mistake.

Uphold oral agreement to pay increased cost

THE PROBLEM: *Through no fault of the contractor, performance of a jail-construction contract had been delayed by litigation over the legality of the contract. The county cancelled a payment warrant that had been issued, but the county board then orally agreed that if the contractor would resume work, the county would reimbursed him for the increased costs. Was the agreement binding?*

THE ANSWER: Yes. (H. J. McNeel, Inc. v. Canyon County, decided by the Idaho Supreme Court.)

The court said that the fact that the county budget, required by statute, had made no appropriation to cover the agreement did not invalidate it. The court also noted that the county would have been bound on a theory of implied contract to reimburse the contractor, even if there had been an explicit oral agreement to do so.

Liability of surety

THE PROBLEM: *Where a contractor on an electric-power-line project gave a performance bond to the owner, could the latter sue the surety without making the contractor a codefendant?*

THE ANSWER: Yes. (Northeast Clackamas County Electric Co-Operative, Inc. v. Continental Casualty Co., 221 Fed. 2d 329, decided by the United States Court of Appeals, Ninth Circuit.)

In okaying a decision to the same effect by the United States District Court, District of Oregon, the Court of Appeals said that because the obligations of the contractor and his surety on the bond were joint and several, suit could be brought against either or both of them.

Officials have right to change public contract

THE PROBLEM: *A municipal sewer-construction contract authorized changes in work. During progress, it was discovered that because of a defective base there should be repavement of a section of a street to its full width instead of replacement of paving as contemplated by the contract. Could the municipal authorities make the change without a reletting on bids?*

THE ANSWER: Yes. (Peters v. Ryan Construction Co., 127 N. E. 2d 242, decided by the Indiana Appellate Court.)

The court cited numerous decisions of the Indiana appellate courts showing that officials empowered to let public-works contracts have the inherent right to make reasonable changes. Otherwise, contemplated work might prove to be utterly useless because of some unforeseen factor.

Contractor earns pay for extra excavation

THE PROBLEM: *An agreement was made as to how much should be paid for constructing a foundation, but the contract did not call for such work as was needed to support adjacent land. The owner, knowing that the contractor was working on a support, told him to do whatever was necessary to prevent a slide. Nothing was said about pay for this extra work. Was the contractor entitled to reasonable pay?*

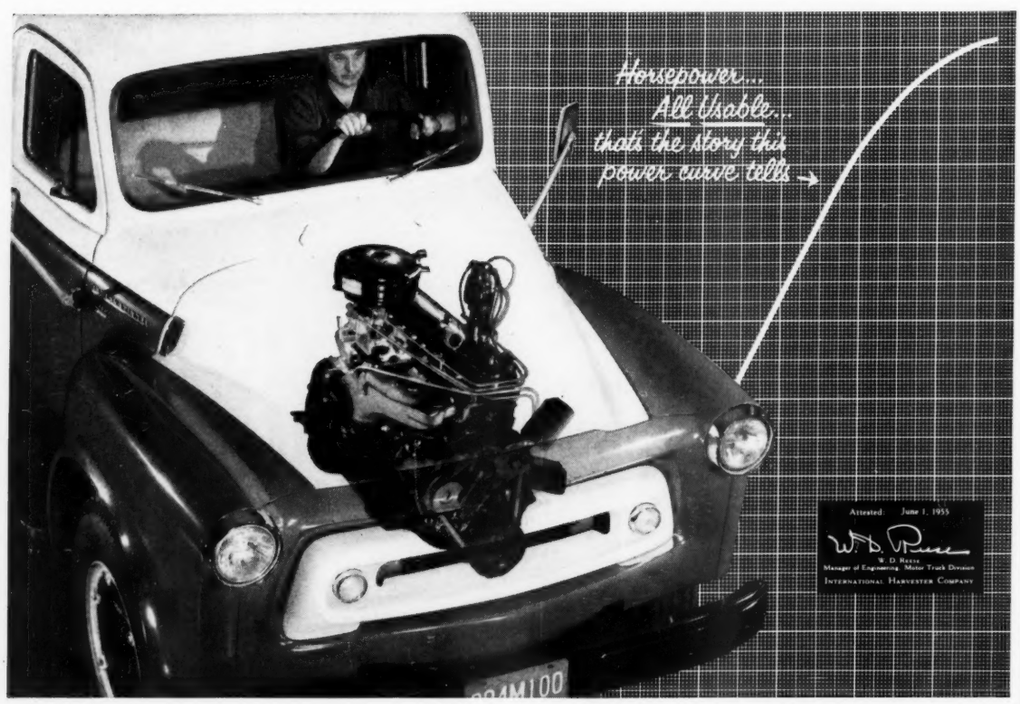
THE ANSWER: Yes. (Hopkins v. Ulvestad, 282 Pac. 2d 806, decided by the Washington Supreme Court.)

Engineers' licenses

THE PROBLEM: *Under the District of Columbia Code, may a corporation be licensed as a professional engineer?*

THE ANSWER: No. (Potomac Engineers, Inc. v. Walser, 223 Fed. 2d 356, decided by the U. S. Court of Appeals, District of Columbia.)

It's usable horsepower that counts!


Horsepower... All Usable... that's the story this power curve tells →
Attested: June 1, 1955
W. D. Rasch
Manager of Engineering, Motor Truck Division
INTERNATIONAL HARVESTER COMPANY

Many passenger car type truck engines have to rev up to high speeds to pull their loads. They strain at the job—cost big money in wear and repair. INTERNATIONAL all-truck engines turn at relatively low rpm—deliver high usable horsepower at normal road speeds, for peak performance, long life, BIG money savings.

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Wise truck buyers want to know *more* than rated horsepower. They want to know what actual *usable* horsepower they are going to get to pull capacity loads at normal, legal speeds—without undue engine strain.

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Motor Trucks • Crawler Tractors • Industrial Power
® McCormick® Farm Equipment and Farmall® Tractors

For more facts, use Reader-Reply Card opposite page 18 and circle No. 325

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   B. Priming line to intake manifold.
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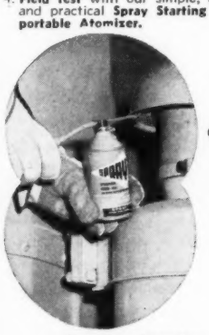

Caterpillar Model D318 Diesel Used in No. 12 Grader

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SPRAY STARTING FLUID COMPANY

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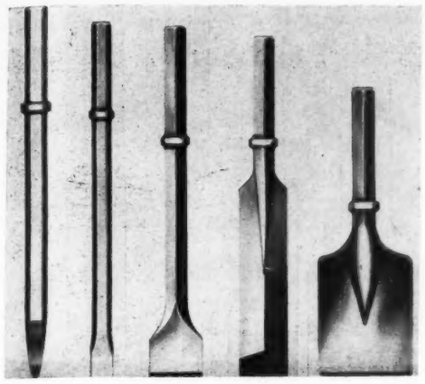

Ingersoll-Rand's new line of pavement-breaking, demolition, and digging tools.

Paving-breaking tools are spark resistant

■ A new line of paving-breaker, demolition, and digging tools announced by Ingersoll-Rand is designed for use where flammable liquids, gases, or dusts could be ignited by a spark.

The tools are forged from a beryllium copper alloy, a material known for its spark-resisting properties and used for years in cast tools for safety purposes. The manufacturer claims the tools will outlast their cast counterparts several times over.

For further information write to Ingersoll-Rand, 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 149.

Full line of equipment

■ A 50-page catalog contains technical data, brief descriptions, and photographs of Syntron vibratory equipment, feeders, conveyors, power tools, diesel pile hammers, gasoline hammer drills, electric hammers, and other available equipment.

To obtain this catalog write to Syntron Co., 227 Lexington Ave., Homer City, Pa., or use the Request Card at page 18. Circle No. 152.

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"Do I look like I'd be interested in a pure silk necktie?"

"Bought Etnyres because they are best..."

Now operating a fleet of three Etnyres, Detroit Concrete Products Corporation of Detroit, Michigan finds the units living up to expectations.

The "Black-Toppers" are easy to load, easy to drain. Bituminous material heats fast. The motor starts easily. Material is evenly distributed. Time and labor costs are reduced.

Three Etnyres are now in use—a 1000-gallon unit for standby jobs, a 2750-gallon unit purchased in 1951, and another 2750-gallon unit purchased in 1952. The "Black-Toppers" are used for work on secondary roads in the county, laying dust on city streets, and special jobs such as surfacing the 60-acre parking lot shown above.

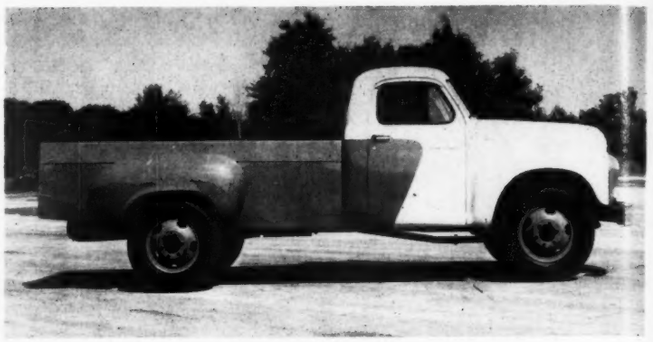
As Mr. Paul H. Thoresen, secretary of the company, says: "We wouldn't have bought Etnyres if we didn't think they were best." Get latest data and prices now on the distributor that gives you greatest value for your dollar. See your nearby Etnyre dealer or write E. D. Etnyre & Co., Oregon, Illinois, U. S. A.

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 328

This one-ton pickup truck, a new model in the Studebaker Transtar line, features 20 per cent greater load capacity. ►



New truck line offers greater payload capacity, other engineering changes

■ Increased payload capacity, greater economy, and a higher degree of operator comfort are highlight features of the new line of Studebaker trucks, according to the manufacturer. The new Transtar line ranges from ½-ton pickup models to 2-ton heavier-duty trucks, and reportedly answers the needs of 85 per cent of the truck market.

Important engineering changes in the line include an electric shift with two-speed rear axle; increases of up to 700 pounds in gvw on pickup models; a new 12-volt electrical system; a new wide-tread rear axle; larger-capacity brakes and springs; and the shortest-stroke V-8 engine in the industry. Many special design features have been incorporated in the light and medium-weight models.

In the light-duty line, wheelbases of 112, 122, and 131 inches are offered, with gvw ranging from 4,800 pounds in the ½-ton model to 9,600 pounds in the one-ton model. Four engines are available, ranging from 92 to 156 horsepower. The heavier-duty models have wheelbases of 131, 155, and 171 inches, and gvw ranges from 14,000 to 16,000 pounds. The 1½ and 2-ton models use a 156-hp engine, and a 175-hp model is also available for the 2-ton truck.

A special feature of the 2-ton model is an electric shift, offered for the first time by Studebaker, which makes available a choice of ten speeds forward and two in reverse.

For further information write to the Studebaker-Packard Corp., South Bend, Ind., or use the Request Card that is bound in at page 18. Circle No. 178.

Bulletin on stainless steel siding

■ Mansard pattern stainless steel siding in galvanized and black steel for single sheet walls, sandwich walls, and decorative panels is described in a bulletin from Joseph T. Ryerson & Son, Inc. The literature points out that these sidings may be used for either inner or outer walls on industrial or commercial buildings.

To obtain this bulletin write to Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill., or use the Request Card at page 18. Circle No. 189.

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announces the Revolutionary NEW
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for medium depth, small diameter holes

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- Requires less power to operate.

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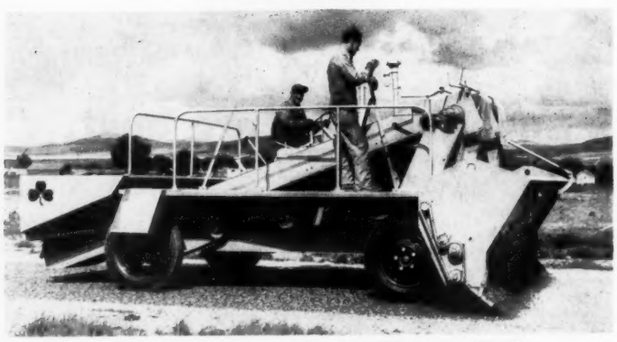
You'll agree,
old type spreaders just won't
fill the bill after you've seen
The Self-Propelled
"SPREAD-MASTER" Power Spreader in Action



. . . the only modern self-propelled chip spreader on the market

Spread cover coat material the modern way . . . it's easier, faster, more economical and superior in results! Two-man crew can make spreading continuous operation—no drag or brooms needed . . . just one straight line of uniform application. Tighter, more uniform mat is achieved by placing larger chips in asphalt first, fines on top. When rolled, choice chips then are keyed and wedged in place.

Using the "Spread-Master", an Arizona contractor applied 205 tons liquid asphalt on road surface and covered it with 1747 tons of seal coat material *in 11½ hours of operating time!*

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POCATELLO, IDAHO

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MULLER MIXERS *and* POWER TROWELS
set quality standards in their fields

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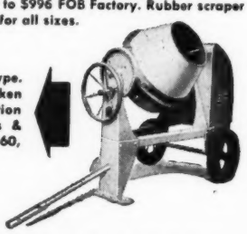
PLASTER AND MORTAR MIXERS
Made in 2, 4, 6, 8 and 10 cu. ft. sizes. Electric motor or gas engine power. All models have Muller Lifetime Paddle Shaft Seal to protect bearings. Power throwouts on smaller models, built-in disc clutch on larger. Many other features. Priced $180 to $996 FOB Factory. Rubber scraper blades are available for all sizes.

CONCRETE MIXERS
3 models, 3 to 6 cu. ft. capacities, tilting type. Ample size drums, fast mixing action, Timken Bearings, electrically welded, sturdy construction throughout. Power—electric motor or Briggs & Stratton Air Cooled Engines. Prices $230 to $660, FOB Factory.



POWER TROWELS
4 sizes—24, 29, 34 and 44" dia., Briggs & Stratton Engines. Stationary guide ring eliminates hand troweling when finishing along baseboard. Engine speed regulated by governor control on handle.

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MULLER MACHINERY COMPANY, Inc.
Metuchen 15, New Jersey
Cable Address, MULMIX

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CUTTING TWENTY HOLES through 7½-inch reinforced concrete floors at the average rate of one every 12 minutes, the equipment shown is estimated to have saved at least a week over the time required to do the job by conventional methods. The Truco equipment consisted of a water swivel and 6¾ x 18-inch diamond bit mounted in a ¾-inch drill motor. The diamond drilling method also reduced noise and dirt, an important consideration, since the job was done in a Dayton department store. For further information write to Wheel Trueing Tool Co., 3246 W. Davison, Detroit 38, Mich., or use the Request Card at page 18. Circle No. 500.

AGC offers booklet on processing change orders

A booklet containing the schedules of the three principal government construction-awarding agencies for the processing of change orders and disputes has been released by the Associated General Contractors of America.

Entitled "Processing Change Orders and Disputes," the booklet has been distributed to field offices and chapters of the AGC, offices of the Corps of Engineers, Bureau of Yards and Docks, the Bureau of Reclamation and other federal contracting agencies.

The booklet consists of a brief introduction, the text of a letter written by the AGC to each of the government agencies, the texts of letters received from the agencies. Copies are available from the AGC national office in the Munsey Bldg., Washington 4, D. C. They may be obtained at 20 cents each.

Universal Atlas opens new sales office

Harold Meyer has been made district sales manager to head the new Milwaukee sales office of Universal Atlas Cement Co., New York, N. Y. He joined the organization in 1943. The new headquarters, located in the Bankers' Building, 208 E. Wisconsin Ave., will serve the company's customers from the Milwaukee manufacturing plant on West Canal St.

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...check the generator
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☐ Gas Drive ☐ Electric Drive ☐ AC Transformer
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Write today for the big, new, 40 page Acker Drill Supplies Catalog. It illustrates and describes over 150 drilling tools and accessories that will save you time and money on auger borings, core drilling and soil sampling.

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*PROVED BY MILLIONS OF MILES

MODEL SP

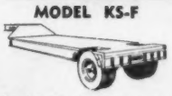
Jack over axle models. Capacities 11 through 25 tons.

MODEL GPX-D

Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.

MODEL TT

Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.

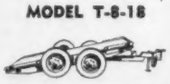
MODEL KS-F

Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.

MODEL GPR

Removable gooseneck. Tandem, triple or trunnion axles. Flat or drop decks, or as beam trailers.

MODEL GTX

Triple axle, 6 dual wheels. Capacities 25 through 45 tons. Flat or drop deck

MODEL T-8-18

14 or 18 foot length between the wheel tilt trailers. 8-10 ton capacity.

MODEL PS

Single axle, spring mounted platform or float.

MODEL PX

Heavy-duty tandem axle, spring mounted platform or float.

MODEL KSO-D

Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.

MODEL MSO-D

Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.

MODEL GXTT

Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

MODEL XTT

Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.

DUMP TRAILERS

Single or tandem axle models. Standard capacities 8 through 15 yards.

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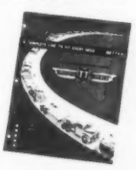

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CEDAR RAPIDS IOWA, U.S.A.

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While steel is being set on the river spans, paving is done on approach spans. Concrete is delivered to 3-yard hopper on the approach by a Lorain Moto-Crane working on the ground.

C&E Staff Photos

Steel and paving work bring bypass span to completion

Last month the 1,847-foot-long Victory Memorial Bridge spanning the Cumberland River at Nashville, Tenn., was completed, bringing to a close a project started in 1951 and continued since then as the Tennessee Department of Highways and Public Works let contracts for the structure. The bridge, crossing the Cumberland at a spot where four other river crossings stood at one time or another, was built as a bypass facility to relieve traffic congestion in the city's business section.

River piers

The first contract, for $435,000, was awarded to C. F. Rule Construction Co., Inc., Nashville, Tenn. for construction of the two river piers. Completed in 1951, these are about 320 feet apart. Each is set on footings 82 feet long, 27 feet wide, and 8 feet deep, which have a 2-foot minimum depth in the riverbed rock.

Each pier has reinforcing which consists of 1¼-inch rounds placed on 6-inch centers. Cofferdams were used in preparing the riverbed rock, in pouring the footings, and in placing the 5-foot-high and 14-foot-wide reinforced-concrete pedestals along the footing.

The pedestals provided a base for the blocks of Georgia granite, each about a foot deep and a foot thick, which face the pier. Placed along the top edge of the pedestal in two layers, the blocks served as a form while the shallow well they created was filled with concrete reinforced by 1½-inch rounds. As soon as another two layers of the granite facing stone were in place, concrete was poured to form another layer of the pier's concrete core. In this way, Rule did two jobs concurrently—the pouring of the concrete core and the placing of the granite facing blocks. Both piers measure 100 feet from the bottom of

SPECIAL REPORT

On the St. Lawrence Seaway

As of the 15th of October, 1955, 17 Manitowoc Shovels, Draglines and Cranes were taking on the "tough jobs" along the St. Lawrence Seaway Project with many more Manitowocs scheduled to appear soon.

Project contractors have found that Manitowoc simplified design, rugged construction, fast mobility and all-around job versatility pays off in speeded-up work schedules.

Put all of the job-tested Manitowoc advantages to work on your next bid. Contact your Manitowoc distributor for the whole "profit-happy" picture.

MANITOWOC ENGINEERING CORP. MANITOWOC, WIS.

OTHER MANITOWOCS ON THE SEAWAY PROJECT

American Bridge Division, U. S. Steel
6 - Manitowoc Model 3500's

Perini, Kiewit, Walsh, Utah, Morrison-Knudsen Combine
1 - Manitowoc Model 4500

Peter Kiewit & Sons Co.
1 - Manitowoc Model 4500

Kiewit-Johnson & Johnson
2 - Manitowoc Model 3900's
2 - Manitowoc Model 4500's

Morrison-Knudsen Co., Inc.
4 - Manitowoc Model 4500's

Equipped with a 6½-yd. bucket, this 4500 dragline operated by Morrison-Knudsen loads 22 cu. yd. wagons in three passes per unit during preliminary work on diversion, cut "F".

This Manitowoc 5½-yd. Model 4500 shovel is excavating at the site of Barnhart Island powerhouse for the combine of Perini, Kiewit, Walsh, Utah, Morrison-Knudsen.

One of six Manitowoc 60-ton 3500 cranes operated by American Bridge — this unit shown placing steel at site of "permanent bridge".

One of the first machines on the St. Lawrence project, this 2½-yd. Manitowoc Model 3500 is shown excavating at the site of Long Sault Dam. The shovel pictured is owned by Dravo Corp.

MANITOWOC
SHOVELS 1-5 YD. Speed Crane CRANES 20-100 TON

For more facts, use Reader-Reply Card opposite page 18 and circle No. 335

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Guy derrick, traveler, and material car place steel swiftly; granite block facing is used as a form for river piers

The 225-foot side span is erected in three sections on two steel falsework bents between the land and river piers. Steel erected by the guy derrick on the ground is used by the American traveler placing the second section between the bents.

the footings to their tops and taper from a 14-foot width at the base to an 8-foot width at the top.

Approach bents, abutments

After this work had been finished, Marion Construction Co., Nashville, began work on a land pier, 15 approach bents, and two abutments for the bridge under a separate $898,000 contract. The pier, bents, and abutments all required 12-inch H-piles to be driven about 55 feet to refusal to provide the necessary support of the spans. The approach bents average 51 feet in height and have caps 3½ feet thick, 6 feet deep, and 61 feet long. Concrete was purchased from a commercial firm which delivered the material directly to the job in ready-mix trucks. Placement of the 250 cubic yards of concrete in each bent was handled by a Lorain Moto-Crane and bucket.

Superstructure

Construction of the superstructure by Nashville Bridge Co., Nashville, got under way in August, 1954, under a third contract amounting to $1,884,258. Aside from the 320-foot mid-span and the two 225-foot side spans, the bridge has 16 remaining spans. Three are 80 feet long, eight are 67½ feet long, one is 67 feet 10 inches long, two 55½ feet, and two, 57½ feet.

Eight 36-inch-deep plate girders were placed on 8-foot centers across the approach bents by a Koehring crane located on the ground. Only four 12-foot 11½-inch-deep girders span the river piers, starting at the land pier. These are spaced 17 feet 10 inches apart over the piers.

Two steel falsework bents erected 90 feet apart between the land pier and the river pier permitted the 225-foot side span girders to be placed.

(Continued on next page)

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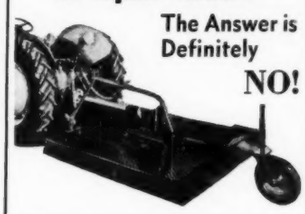

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Placing the structural steel for the bridge superstructure is this American 55-ton traveler powered by a GM 4-71 diesel with torque converter. The traveler, with its 80-foot boom, walks across the bridge placing steel ahead of it.

(Continued from preceding page)

The distance between the land pier and the first falsework bent is 45 feet —enough clearance for a railroad track that runs between the two.

The high-tensile silica steel plate girders, fabricated at Nashville Bridge Co's. plant in Birmingham, Ala., were shipped directly to the bridge site by rail. An American 55-ton guy derrick with a 103-foot mast and a 90-foot boom and powered by a Lidgerwood double-drum steam hoist with an auxiliary swing engine handled all placing of steel during the first stages of erection. Located on the ground between the land pier and the first falsework bent, the guy derrick took steel directly from the rail cars and placed it between these two points.

Then an American 55-ton traveler powered by a GM 4-71 diesel with a torque converter was moved onto the girders erected by the derrick and, from this position, began placing the second sections until the second falsework bent was reached. The traveler, working in a 60-foot radius with its 80-foot boom, continued its journey across the Cumberland while a track was laid alongside it, extending back to the land pier. This is being used by a material car bringing steel to the traveler.

The guy derrick, working between the land pier and the first falsework bent, transferred structural steel from incoming rail cars to material car riding the rail on the bridge. This car was pulled up the 3 per cent grade of the approach span by a gas-operated double-drum Clyde hoist. Bolted field connections on the steel was made with an Ingersoll-Rand impact wrench, while riveting was handled by a Boyer 90 hammer.

Before the 320-foot mid-span was placed, additional falsework bents were required between the river piers so that there was no interference with river navigation. The vertical clearance at the mid-span is approximately 97 feet.

Decking and roadway

Nashville Bridge Co. subcontracted the construction of the reinforced concrete deck to Oman Construction Co., Nashville, for more than $180,000. The deck consists of two 26-foot roadways separated by a 4-foot concrete mall 5 inches high. Sidewalks on each side are 8 feet wide and 2 inches high. The roadway slab itself consists of 6½-inch-thick reinforced concrete topped with a 2½-inch-thick open graded asphaltic-concrete wearing course.

Oman Construction Co. used ¾-inch plywood forms, supported by 2×4-inch walers and 2×8-inch

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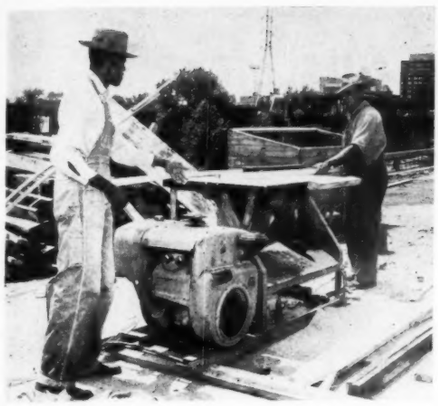

Workmen use a Superior 12-inch circular saw powered by a Wisconsin engine to cut lumber for formwork.
C&E Staff Photo

joists, suspended from the top flange of the plate girders. Form fabrication was done on the new deck with a Superior 12-inch saw powered by a Wisconsin engine handling the cutting of new lumber.

A Lorain Moto-Crane rode the ground alongside the approach bents, delivered concrete to a 3-yard hopper on the bridge with a 1-yard bucket handled by its 60-foot boom and 15-foot jib. Hand buggies took the concrete from the hopper to the prepared and oiled forms. Concrete was consolidated by a Maginniss Hi-Lectric vibrator and finished by a Master vibrating screed. The freshly poured concrete, which used air-entraining cement like that used in the bents, was then cured for seven days and covered with burlap. Water for curing was purchased from the local supply. Installation of 4,720 feet of aluminum hand rail and the needed lighting fixtures finished work on the bridge.

The Victory Memorial Bridge is built in the best possible location for a vehicular bypass facility. Four other crossings existed at this point on the Cumberland at various times. A ferry service was in operation at this site for 35 years before a stone-arch bridge, the first, was erected in 1825.

L. C. Anderson was the superintendent for Nashville Bridge Co., and B. L. Ham was the superintendent for the Oman Construction Co. Representing the Tennessee Department of Highways and Public Works was Roy Higgs, senior resident engineer. Howard, Needles, Tammen, and Bergendoff, New York City, was the consulting engineering firm on the job.

THE END

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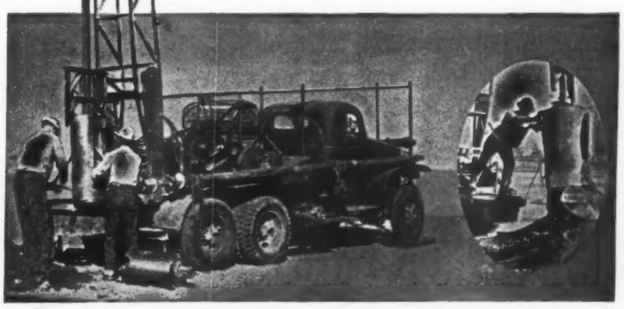

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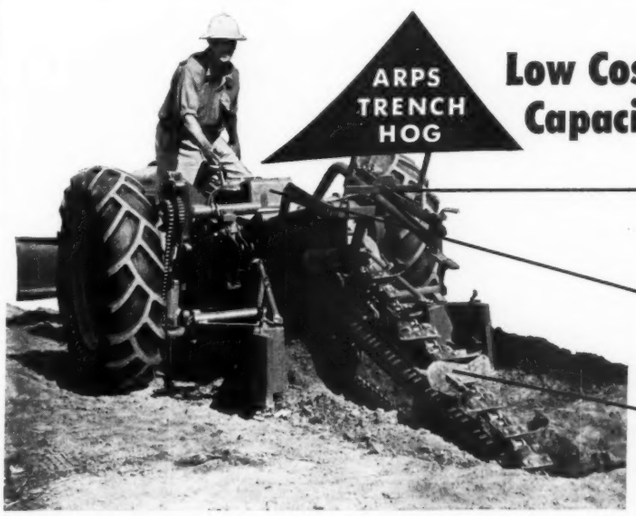

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Short cuts and extra care get big concrete pipe into place

At the base of the high mountains near the Great Salt Lake a Bucyrus-Erie ¾-yard dragline excavates for one of the structures in the aqueduct.

Difficulties ordinarily involved in laying concrete pipe up to 84 inches in diameter are being magnified on the 18-mile-long Davis Aqueduct being built near Ogden, Utah. Eventually, irrigation and domestic water will be carried by this aqueduct from Weber River in the mountains to the agricultural lands and towns between Ogden and Salt Lake City in a vital part of the U. S. Bureau of Reclamation's Weber Basin project.

Right now, other parts of the project like Wanship Dam in the headwaters, Stoddard Diversion Dam, and the enlargement of Pineview Reservoir are nearing completion, insuring that water will be ready to be routed through the aqueduct on its completion in May, 1957.

The toughest part of the work on the Davis Aqueduct is due to the nature of the terrain. The line runs through the mountains, high above the land it will irrigate. In several sections it dives 500 feet down the steep sides of canyons, then rises to almost the same elevation at the opposite sides.

The terrain has also made transportation of the heavy pipe sections extremely difficult. Two miles of the aqueduct consist of 84-inch-diameter

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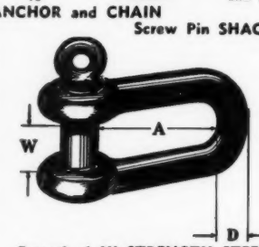

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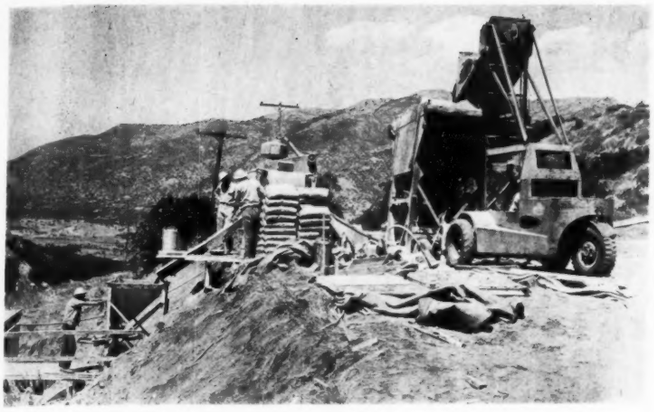

Work on structures is moving along fast with portable concreting setup used by Pritchett Construction Corp. Here a Gar-Bro buggy takes concrete from a Gar-Bro hopper fed by a Kwik-Mix Dandie mixer. A Wagnermobile scoop charges aggregates into a 3-compartment batcher with Thurman beam scales.

pipe; 8 miles consist of 78-inch pipe, and the remaining length consists of 66-inch pipe. Some of the 18-foot joints of 84-inch pipe weigh close to 30 tons, and handling these heavy weights on steep mountain slopes will not be an easy job. The present plan calls for pioneer access roads to be bulldozed at many points along the walls of gorges, so that a crane laying the sections will be able to reach three or four joints at a time. At best, it will be a slow, laborious, and dangerous job.

Jobs are subcontracted

United Concrete Pipe Corp., Baldwin Park, Calif., the firm that is doing the work, has a staff equal to the job. General superintendent Charles Nickolaisen, now acting as project manager, has had experience with laying pipe in rough terrain for the Hetch-Hetchy Aqueduct near San Francisco. Richard Bone, general foreman, has been on the Davis Aqueduct job since it started.

Working with United are two Utah contractors, Young & Smith Construction Co., Salt Lake City, and Pritchett Construction Co., Provo, Utah. The first firm has subcontracted all trench excavation and pipe laying; Pritchett has the subcontract for concrete work on various structures, including turnouts, vents and blow-off structures, and venturi meters. Elmo Longstroth, heading operations for Young & Smith, is a skilled dirt man. Mel Pritchett is in charge for Pritchett Construction, a firm with wide experience in building concrete structures like those needed on this job.

Started late in 1954, the job has long since settled to an established schedule of pipe delivery, trench excavation, and pipe laying.

Rock poses problems

Only a small portion of right-of-way preparation has been easy. In some of the high places where the line goes through the rock of the Wasatch Mountain range, drilling and shooting has been necessary. Some of this has been extensive, since the right-of-way varies from 100 to 300 feet in width. United Concrete Pipe Corp. using two Gardner-Denver wagon drills and two Jaeger air compressors to get powder holes down, has assigned two D8's and a Caterpillar DW10—all with bulldozers—for moving blasted rock and leveling the

(Continued on next page)

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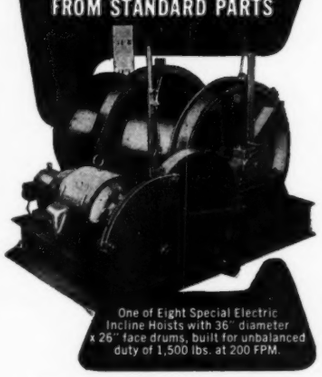

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An 8-foot section of pipe is swung directly into the trench from a Peterbilt transport by a Lima 1201 crane, saving secondary handling and storage of the sections. The transport hauls directly from the manufacturing yard.

(*Continued from preceding page*)

right-of-way. A considerable amount of benching has also been necessary where the line goes down steep canyon walls.

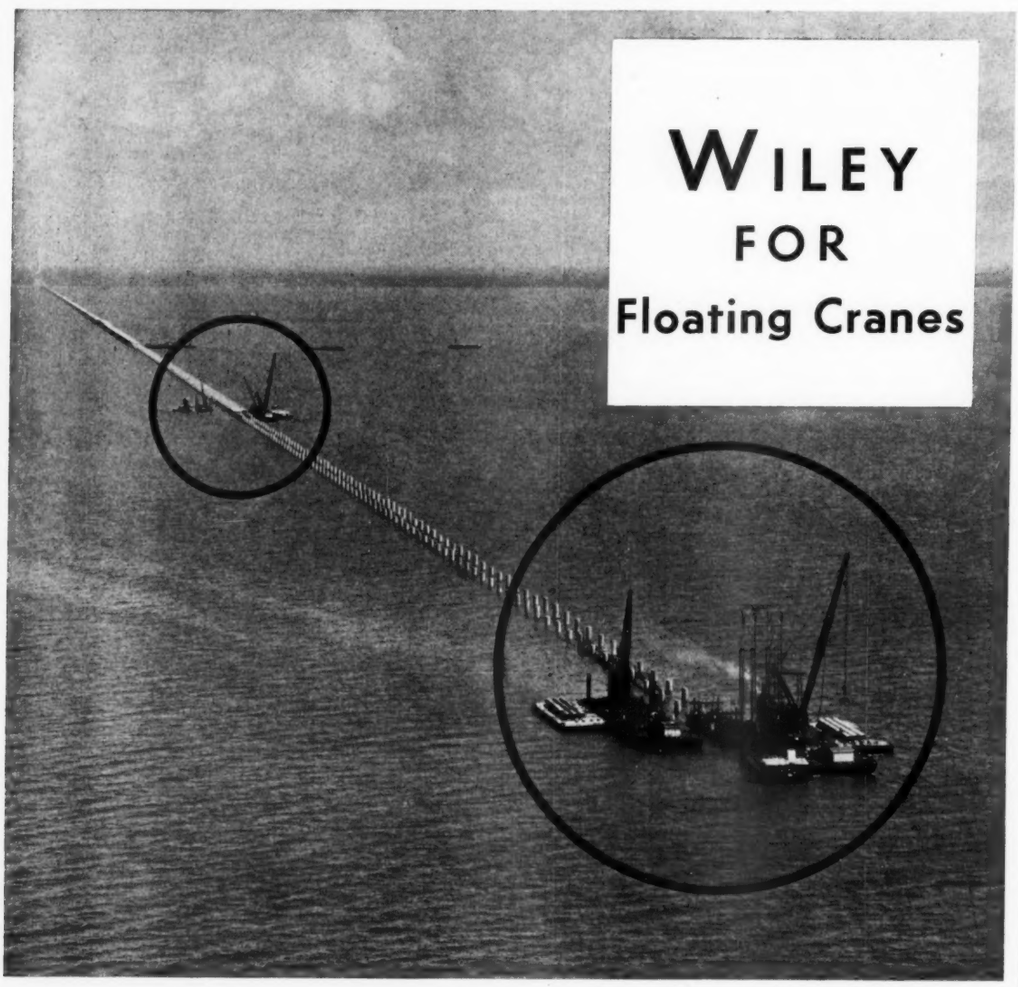
Young & Smith, starting trench excavation with a P&H 955 backhoe, also planned to bring in a Northwest 80-D backhoe and a Manitowoc 4500 for this work. As the ditch is dug, excavated material is being cast to one side so that it will be readily available for backfill. No extensive hauling or rehandling of material should be required after the aqueduct is finished, although borrow will be needed in some areas. Some extra work is required where the line passes through agricultural areas. Here, specifications require that topsoil be saved and segregated so that the land can be restored to its productivity.

Like work on the right-of-way, trench excavation also required a sizable amount of drilling and shooting. The trench is at least 12 feet deep in all locations, and in some spots it goes as much as 20 feet deep. Young & Smith are using Jaeger air compressors, several hand-held pneumatic jackhammers, and 40 per cent Atlas gelatin powder for this work, and the combination has worked well, particularly on rocky outcrops above the trench grade. If heavier rock formations are found, Cleveland wagon drills will be used.

Efficient pipe handling

Pipe for the aqueduct is being turned out by United Concrete Pipe Corp. at its manufacturing plant and yard at Pleasant Grove, Utah, about 30 miles south of Salt Lake City. This plant is also supplying pipe for the Weber Aqueduct and seven large siphons which also form part of the Gateway Canal project.

United is using six Peterbilt truck-tractors and pipe trailers and four Sterling transports to haul sections to the site. These powerful units, usually hauling capacity loads, sometimes require an assist from tractor equipment to get up steep grades to the right-of-way. Production schedules at the plant have sometimes made it necessary to unload and store some pipe temporarily, but



Construction progress continues on the Lake Ponchartrain Causeway, three of four Model 124 Wiley Floating Cranes owned and operated by the Louisiana Bridge Co., are illustrated, serving this construction program.

For dependable Floating Equipment, discuss your requirements with Wiley Engineers.

WILEY MANUFACTURING COMPANY
BARIUM STEEL CORPORATION SUBSIDIARY

P.O. BOX 97, PORT DEPOSIT, MARYLAND PHONE: PORT DEPOSIT DRAKE 5-2111

For more facts, use Reader-Reply Card opposite page 18 and circle No. 351

A Caterpillar tractor dozer backfills excavated material into the trench. A ¾-yard dragline also assists in the backfilling operation.

whenever possible, sections are being picked off trailers and laid directly on the trench grade to save both time and secondary storage.

A Lima 1201 and a Lima 1001 dragline, equipped as heavy-duty cranes with multiple-way blocks and 1-inch hoist lines, have the job of laying the pipe. Finegrading in the trench is being carefully done, particularly in places where the line bends and joints have to be laid precisely. In many places, the Limas could not lay the pipe until holes had been dug out of solid rock to bed the bell and spigot joints. The sections being laid have a rubber gasket that will prevent leakage after the line goes into service.

To insure that the big line is on a solid footing, USBR specifications call for a select cushion material to be placed underneath the pipe and to a point up its sides to the spring line. This cushion material, available at several sites along the 18-mile project, is being consolidated around the pipe by a combination of flooding and vibratory compaction.

Two vibrators—a Dart gasoline-driven machine and a compressed-air vibrator powered by a Jaeger 105-cfm compressor—are doing this job. Water for this operation is being hauled to the site by a Ford 2,500-gallon tanker, and a Rex centrifugal pump assists in the unloading operation. As water is applied to the cushion material, two men work the tips of vibrators under the pipe. This combination of flooding and vibration effectively works a solid bank of dirt below the bearing points of the big line.

Backfilling is being done by several Caterpillar dozers, a Bucyrus-Erie ¾-yard dragline, and a Lorain ¾-yard dragline. Backfill material is carefully cast over the pipe by a dragline until the pipe is fairly well covered. Then dozers take over to shove the remaining yardage into place and dress off the right-of-way.

At canyon and creek crossings, the line will be protected against flash floods with a rip-rap cover. Some extra work was required on stream crossings also. Water rights on the streams are so firmly established that adjacent landowners demanded—and got—a full flow in clear condition on

(*Continued on next page*)

Here's the New STETCO Catch Basin Cleaner and HIAB Crane

Now you can clean catch basins with just one man, loading his own or other trucks. Dual controls provide full operation from either side. And your truck is also available for its regular work.

STETCO bucket equipment and HIAB cranes can easily be installed on any truck. The cost is low and the equipment is rugged. Write for folder and name of nearest distributor.

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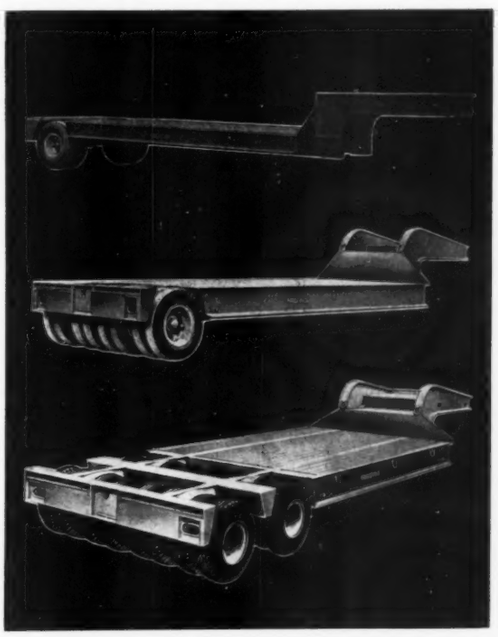
NEW MODEL HTS
20 Ton Capacity
WEIGHS ONLY 8,250 POUNDS
(also available in 15, 25, 30 and 35 ton capacities)

New Dorsey HTS Models are as much as a ton lighter in weight than other trailers of comparable capacity. High tensile steel main channels and close-spaced all welded cross members increase carrying capacity. Flat type gooseneck provides support for blades and other loads. Wheels in tandem "walk" on stub axles over tough terrain, for easy pulling—with load stability—on highways or in the "rough."

THERE'S A DEPENDABLE DORSEY FOR EVERY TOUGH JOB . . .

On construction jobs all over the world Dorsey Low Beds have proven themselves dependable, easy-handling and efficient under the toughest conditions. The units illustrated are standard and are available for prompt delivery in capacities from 10 to 75 tons, while 100-ton trailers are built to order. For unusual requirements, utilize the experience of Dorsey engineers to design special equipment.



MODEL "MK"
Light weight and highly maneuverable, this low-cost model comes in 10 and 15 ton capacities, semi and full trailers. The level deck is standard, but 6 or 9 inch drop deck may be specified at low additional cost.

MODEL "M"
Semi and full trailers in 15, 20 and 25 ton capacities. Two trunnion tubular oscillating axles provide smooth, easy riding, absorb road shock and strain.

MODEL "MT"
Capacities; 35, 40, 50, 60 and 75 tons in both semi and full trailers are standard, with as high as 100-ton capacity on special order. Eight steel spoke dual wheels mounted on four oscillating axles set in tandem on walking beams. New air actuated braking system without troublesome rods and connections.

Standard equipment on all low beds include: ICC lights and reflectors, directional signals, brakes, lashing D's, rear loading ledge, two coats prime and one coat finish paint.

DORSEY TRAILERS ELBA, ALABAMA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 353

The select cushion material reaching from underneath the pipe to the spring line is consolidated by a combination of flooding and vibratory compaction. As the Jaeger compressor and Dart vibrator work, water is pumped to the trench from the tank truck.

(*Continued from preceding page*)

these streams at all times. Nickolaisen solved this problem by carrying streams through diversionary corrugated metal pipe works while the aqueduct was being installed.

Pipe jacking

At several points along its route, where the line intersects several railroads and highways, the handling of the big sections was made even more difficult, because they had to be jacked into place. The first step in running the line under the Denver & Rio Grande Western Railroad, the Union Pacific Railroad, the Bamberger Railroad feeding Hill Field near Ogden, and U. S. 91 and 89 was to jack pipe casing under the roads and railroads. Then pipe sections were installed and graveling or grouting done around the space between the line and the casing. The longest jacking job was done under the Union Pacific Railroad, where eight 16-foot lengths had to be laid.

The equipment doing this job for UCP includes a Lima truck-crane, a Jaeger air compressor, and two Duff-Norton 200-ton hydraulic jacks. A small ½-cubic yard scraper of light metal, rigged up by Nickolaisen in the company machine shop, removes excess material from the heading and eliminated the need for conventional hand labor on this operation.

The scraper was built to fit the curved bottom of the pipe casing. As material is mucked out from a heading with pneumatic clay spades, it is shoveled over the top of the scraper to the pipe casing. When the drag cable on the Lima crane pulls the scraper toward the outside of the casing, the scraper pushes the dirt toward the opening.

Building concrete structures

While trenching and pipe laying operations are going on, Pritchett, subcontractor for the concrete structures, is making good headway on its work. The firm developed a fast method of placing concrete, using portable equipment and stockpiles of ¾-inch-minus aggregate, ½-inch-minus aggregate, and sand, at each of the structure locations.

Conventional concrete forms, consisting of either plywood or shiplap facing nailed to 2×4 studs with doubled 2×4 wales, are prevented from spreading by high-tensile steel tie bolts or steel snap ties.

The good rate of production on these structures is due largely to the portable units being used by Pritchett. A Wagnermobile scoop loads sand and two sizes of aggregate to a three-bin batching hopper equipped with a set of Thurman beam scales. Each batch weighed from this hopper passes to the skip of a Kwik-Mix Dandie mixer, where Ideal sacked cement (Type 1) is added. The mixer dumps to a Gar-Bro transfer hopper, which gives temporary surge storage capacity on many of the structures.

GIVES YOU CRAWLER-LIKE FLOTATION AND TRACTION!

THE NEW ALL-DUTY GENERAL L.C.M.

LOGGING CONSTRUCTION MINING

with Stronger-than-Steel NYGEN CORD

☆ **MAX-TRACTION**—No other tire so nearly approaches ideal crawler-like flotation and traction as this rugged new General L. C. M., greatest ever developed by tire engineers.

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☆ **ALL-DUTY**—The opened-up tread of the new L. C. M. makes it truly an all-duty tire for all type operations. Reduces rolling resistance...increases tread life.

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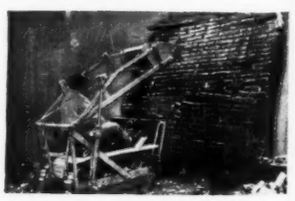

Whether you're wrecking, backfilling, dozing, plowing snow . . . or doing any one of hundreds of other earth-moving jobs . . . you'll save man-hours with the versatile AGRICAT! That means getting the job done faster at less cost! Don't take our word for AGRICAT'S adaptability . . . make us prove it!

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For more facts, circle No. 355

CONTRACTORS AND ENGINEERS

Gar-Bro buggies bring concrete from this transfer hopper to various points of the pour. Pritchett is using four Dart Wisconsin-driven vibrators to consolidate the material. A Jaeger 105 compressor is used on each pour for cleaning construction joints and doing other odd jobs. White pigmented membrane-type curing solution is being used for curing all structure concrete.

Personnel

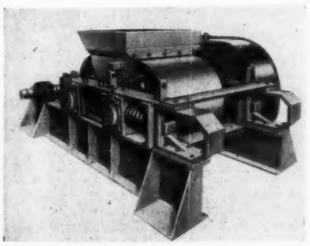
All work on Davis Aqueduct is under the general direction of L. N. McClelland, assistant commissioner and chief engineer, Denver, and E. O. Larson, regional director of the USBR in Salt Lake City. Clinton D. Wood, projects manager of the Weber Basin project, is assisted in field supervision by L. R. Dunkley, construction engineer. Earl C. Christensen, resident engineer, supervises the engineering and inspection of Davis Aqueduct. THE END

Increased capacity for aggregate crusher

■ A new twin-roll crusher which the company claims will increase production 33 1/3 per cent over its smaller counterpart without a corresponding increase in cost is offered by Pioneer Engineering Works, Inc.

Modified design incorporating a hydraulic jack and shim adjustment mechanism also simplifies changing of the roll setting to vary the size of the crushed product.

The new crusher has rolls 30 inches in diameter and 24 inches in width,



Pioneer Engineering's new 30 × 24 crusher produces up to 254 tons of minus-2¼-inch aggregate per hour.

and boasts a production rate one-third again as much as the next smaller size—the 30 × 18 unit. Capacity of the new 30 × 24 crusher runs up to 254 tons of minus-2¼-inch aggregate per hour, based on material weighing 2,700 pounds per cubic yard. Maximum feed size is 4½ × 4½ inches, when using low corrugated rolls. Over-all dimensions of the new unit are 8 feet 6 inches long × 6 feet 10 inches wide, and 53½ inches high. Weight is 11,200 pounds, and power requirements are in the 85 to 105 hp range.

For further information write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 464.

"No organization . . . has done such great constructive work with the efficiency, dispatch, sympathy and understanding with which the Red Cross has accomplished its work."

—Gen. John J. Pershing

For more facts, circle No. 356→

Crane and shovel group names officers, directors

The Power Crane and Shovel Association, at its annual meeting last month, elected officers and directors of the organization to serve during the 1956 club year.

D. W. Lehti, president of the Link-Belt Speeder Corp., Cedar Rapids, Iowa, was elected president, and M. B. Garber, vice president in charge of sales of the Thew Shovel Co., Lorain, Ohio, vice president.

Newly elected directors are P. H. Birckhead, vice president of Bucyrus-Erie Co., South Milwaukee, Wis., and C. B. Smythe, president and treasurer of the Thew Shovel Co. Both will serve three-year terms.

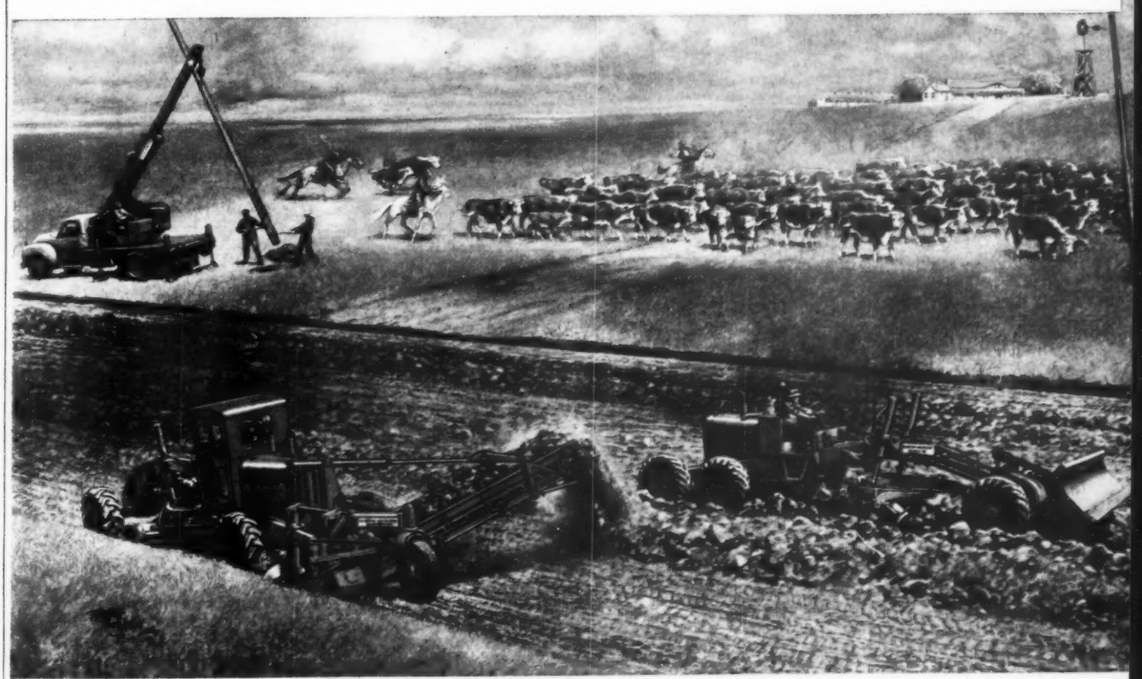
Members of the Board of Directors continuing in office are D. H. Ross, Clark Equipment Co., Benton Harbor, Mich.; Fred Salditt, Harnischfeger Corp., Milwaukee, Wis.; F. W. Zimmer, Manitowoc Engineering Corp., Manitowoc, Wis.; and J. P. Courtright, Marion Power Shovel Co., Marion, Ohio.

Herbert S. Blake, Jr., executive secretary of the association, maintains headquarters at 75 West St.,, New York, N. Y. Membership in the organization consists of thirteen of the major manufacturers of power crane and shovel equipment.

Worthington Corp. news

The 1956 sales campaign for the Worthington Corp.'s complete line of construction machinery will begin at a special meeting on January 28. The Harrison, N. J., firm will hold the meeting at the Conrad Hilton Hotel in Chicago, Ill., immediately prior to the AED convention. The presentation of new products, design advantages, and improvements in equipment will be made to company distributors at the meeting.

Make Yours an Austin-Western in '56



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The unequalled performance standard of each Austin-Western product is the result of advanced engineering skill teamed with years of manufacturing know-how.

To be sure —
There is no substitute for Austin-Western quality.
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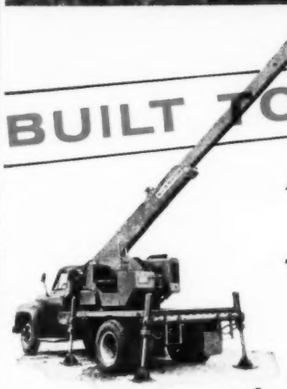
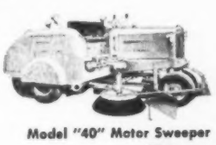


Truck-Mounted Hydraulic Crane



Model "40" Motor Sweeper

Tandem Roller

Self-Propelled Hydraulic Crane

4x4 Power Graders (88-L and 99-L)

6x6 Power Graders (Super 88 and Super 99)

3-Wheeled Roller

Austin-Western
Power Graders · Motor Sweepers
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BALDWIN LIMA HAMILTON BLH Construction Equipment Division

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CONSTRUCTION EQUIPMENT DIVISION
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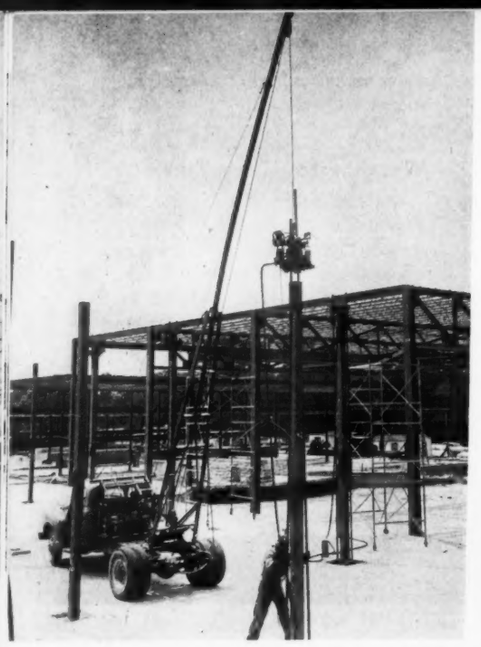
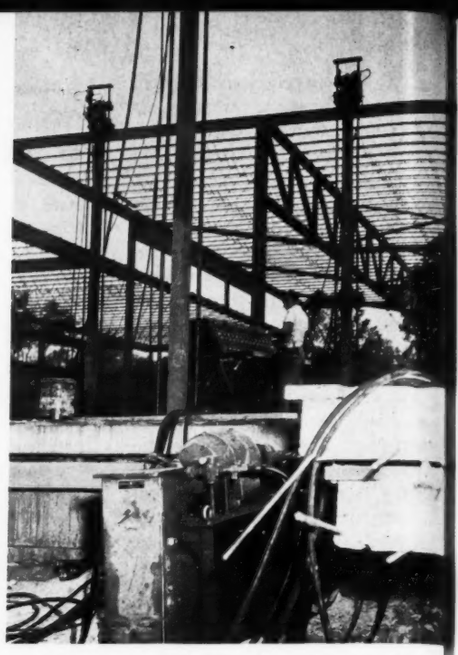
AURORA, ILLINOIS, U.S.A.



1. In preparation for a lift, a hydraulic jack is set in place atop one of the steel columns by a GMC winch truck with an extra-long boom. Each jack is operated by an individual set of valves at the control panel. *C&E Staff Photo*

2. After the jacks are mounted on each column, a workman on a Safway scaffold attaches the hydraulic lines and makes final adjustments. Other jacks (background) are already in place. U. S. Lift Slab Corp., Austin, Texas, manufactures the jacks. *C&E Staff Photo*

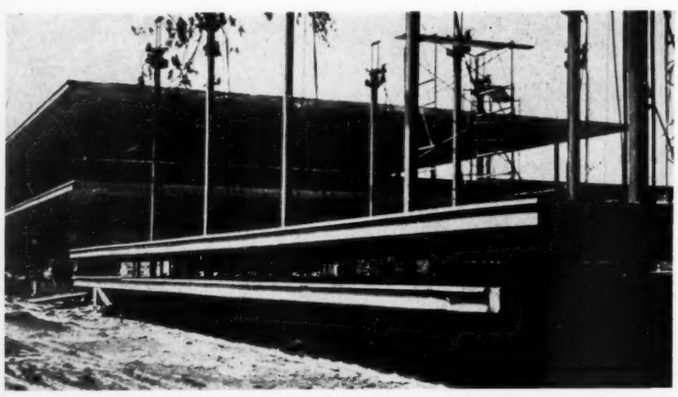


3. Fluid is distributed under pressure to the individual jacks through hoses attached to the control panel. The hydraulic pumps in the foreground supply the fluid. Here, the upper slab has been raised about one inch off the lower. *C&E Staff Photo*

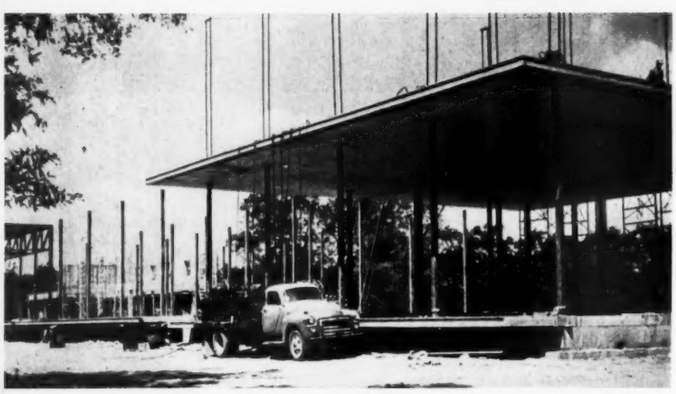
Lift Slab method raises school floors and roof

by RALPH MONSON, field editor

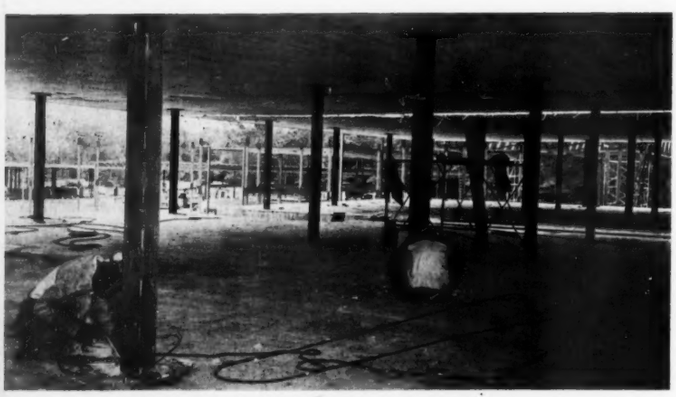
Slabs poured on pan-and-joist first floor are lifted into place; reinforced concrete is used on other sections



5. A roof slab for the two-story section starts upward at a rate of 6 to 8 feet per hour. A lever-operated master control moves all the jacks simultaneously. Once in position, the slab is held in place by steel sleeves welded to the steel columns.

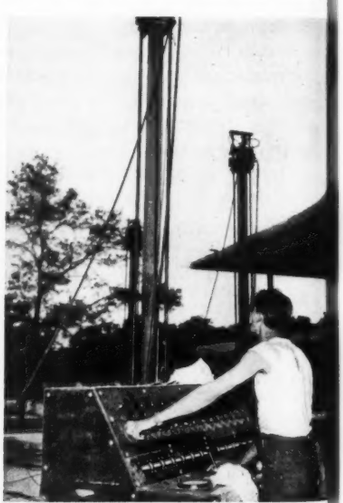


6. After the jacks have been raised into position on the top of the slab and welders have attached the steel sleeves, the jacks are returned to the ground to pick up another slab.



7. Welders make the permanent connection between the floor slab and the supporting columns on the second floor of the building. Steel slabs welded to the under side of the jacking plates complete the connection. *C&E Staff Photo*

4. This control panel regulates the flow of hydraulic fluid to the pumps and insures that the slab is raised evenly. In the background are two floors of a section that have already been raised. *C&E Staff Photo*



Coupling of the Lift Slab technique and conventional concrete-and-steel construction methods helped a contractor to step up the pace of work on the new John L. McReynolds junior high school in Houston, Texas. In this job, approximately 100,000 square feet of slabs for roofs and second floors was cast on top of the pan-and-joist first floor and raised into place by the Lift Slab method in what is believed to be the first application of its kind.

The school is located on a 20-acre site in the Denver Harbor area of the city. The $1,864,000 modern structure contains one-story reinforced-concrete sections, built by conventional methods, and the auditorium is completely framed with structural steel, including columns, roof trusses, and bar joists.

Farnsworth & Chambers Co., Inc., Houston, general contractor on the job, began clearing and grading the site in the fall of 1954, dozing trees and brush into piles and burning them. Grading involved hauling about

Concrete for a column in a conventionally constructed part of the school is poured from a Gar-Bro ¾-yard bucket handled by a crane and is consolidated by a Wyco electric vibrator.
C&E Staff Photo

40,000 cubic yards of material to make a fill averaging 2 feet deep over the building area.

Footings ranging from 3 to 8 feet in diameter were drilled in the heavy clay soil to a depth of 8 feet below the natural ground level and were underreamed. This portion of the work was sublet to Miller-Haden Co., Houston, which used three drilling rigs on the job. Concrete for the footings was poured directly from transit-mix trucks. Buggies transferred concrete for the first floor slab and grade beams from the ready-mix trucks to the forms.

Pans form first-floor slab

Ceco steel pans formed the first-floor slab in the sections where slabs were to be used and in most other areas. Joists are about 10 inches deep and 5 inches wide, and the concrete slab over the pans is just 2 inches thick. Since this was a relatively light floor on which to cast the slabs, the pans and shores were left in place under the floor until the Lift Slab operation was complete.

Concrete for the floor and beams was consolidated with Wyco electric vibrators and finished by Whiteman power trowels. Lift Slab roofs were then built for the cafeteria and shop buildings, and for second-floor and roof slabs in the two-story classroom wings.

When the slabs were cast, the first floor was given two coats of Thompson's super silicone water seal applied by hand with a Hudson spray at the rate of 400 square feet per gallon. This material was apparently very effective in breaking the bond between the floor and the slab that was cast on it.

Slabs for the second floors were 10¼ inches thick, and roof slabs were 8 inches thick. The lightweight concrete was dry-batched from a plant on the site and mixed in a Koehring 16-E Twinbatch paver on rubber tires. Two sizes of Haydite lightweight aggregate, ranging from ¾ inch down, and sand were batched from a Blaw-Knox three-compartment bin charged by a Northwest crane. Sack cement was added to the batches by hand at the rate of six sacks per cubic yard of concrete, and Sika air-entraining agent was added at the mixer.

In pouring the slabs, the paver was set so that its bucket dumped into a Gar-Bro 2-yard double-gated hopper. Workmen wheeled the concrete in buggies from the hopper to the slab, where it was spread and screeded by hand. Second-floor slabs were finished with the Whiteman power trowels.

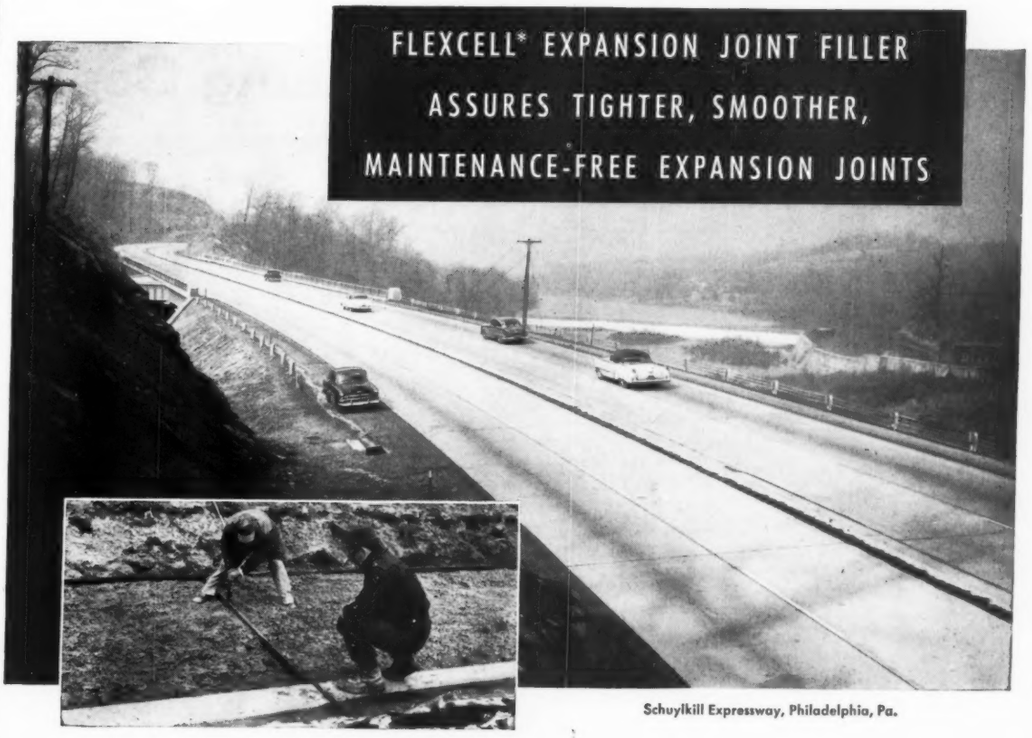
A layer of Perlite insulating concrete, placed over the roof slabs before they were raised, consisted of an expanded shale aggregate, Coralux, which was mixed in the Koehring paver with cement, water, and Sika air-entraining agent, and was placed in the same manner as the Haydite concrete. The roof insulation tapered from a thickness of 1⅝ inches at the edges to 4 inches at the crown to provide a slope for drainage.

This insulating concrete resembled standard concrete in appearance, was apparently tough and durable, and the surface was not damaged by the operation of a winch truck setting the lifting jacks.

Where both the second-floor slab and the roof slab were cast on the floor, the second-floor slab was cast first and given a double application of Thompson's seal. Then the roof slab was cast directly on the second-floor slab, and the insulation was

(*Continued on next page*)

Smoother, easier driving...mile after mile ...on the Schuylkill Expressway



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Severest traffic and climatic conditions have tested tough, durable Flexcell Expansion Joint Filler . . . shown it to be a big cost-saver in long years on the job. The reason: The extreme resiliency of its rugged cane fiber board core. When concrete expands, Flexcell Expansion Joint Filler compresses without extruding. As concrete contracts, the filler springs back to normal. Joint stays neat, smoothly closed. Laboratory tests prove that even after compression to 50% of original thickness, a "recovery" of over 70% is made.

Flexcell Expansion Joint Filler is low in cost, easy to work with, provides finished joints without trimming. Impregnated with a durable asphaltic compound to resist moisture. Protected against dry rot and termite attack by exclusive Ferox® Process. Will not become sticky or brittle with weather changes. And its rough-textured surface makes a firm bond with concrete. It's ideal for work involving special cutting, tapering, fabricating.

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 357

Working on a one-story section of the building, men start assembling a roof form using Acrow adjustable shores, Ceco steel-form joists, and Uni-Form panels. The column at the right has already been tied with Bull Winch clamps.
C&E Staff Photo

(Continued from preceding page)

placed. When the slabs had cured sufficiently to gain the required strength, the lifting operation began.

Hydraulic jacks lift slabs

Supporting columns of structural steel, placed before the slabs were cast, were formed of two angles welded into a square. The columns to be exposed in the finished structure were joined with a continuous weld, and those which will be encased were tied with 4-inch welds spaced 1 foot apart. Three sizes of columns were used, ranging from 4⅜ to 6⅜ inches square.

Special hydraulic jacks manufactured by U. S. Lift Slab Corp., Austin, Texas, were mounted on top of each column. Two long threaded rods extended from the jacks at the top of the column down to the steel jacking plates embedded in the concrete of the slab. After the jacks had been set by a GMC winch truck with an exceptionally long boom, each jack was joined to the control panel by a pair of hoses which conduct the fluid operating the jack.

Testing and adjustment of each jack before the lift began was handled by individual sets of valves at the control panel. A master control operated all of the jacks simultaneously when the lift began. Pumps powered by electric motors delivered the hydraulic fluid under pressure to the control panel, from which it was circulated through the jacks. After making a careful initial lift to break the bond between the slab being lifted and the one directly below, the jacks raised the slabs at a rate of 6 to 8 feet per hour.

When the roof slab had been raised into position, the jacking plates in the slab were welded to each column. Steel scabs were later welded to the underside of the jacking plates and to the columns to complete the connection. The long jack screws were then lowered to engage the second-floor slab, which was raised into place in the same manner.

The Lift Slab method was used for six sections of the two-story classroom construction, measuring about 70 × 80 feet and including two lifts—the roof and second floor. The largest section raised in a single lift was the roof of the shop building, measuring 48 × 130 feet. Single-story classrooms were also constructed by this method.

The Lift Slab work was done under a subcontract by Lift Slab, Inc., San Antonio, Texas, operating under a license from U. S. Lift Slab Corp., Austin, Texas, which manufactures the lifting equipment.

Concrete frame construction

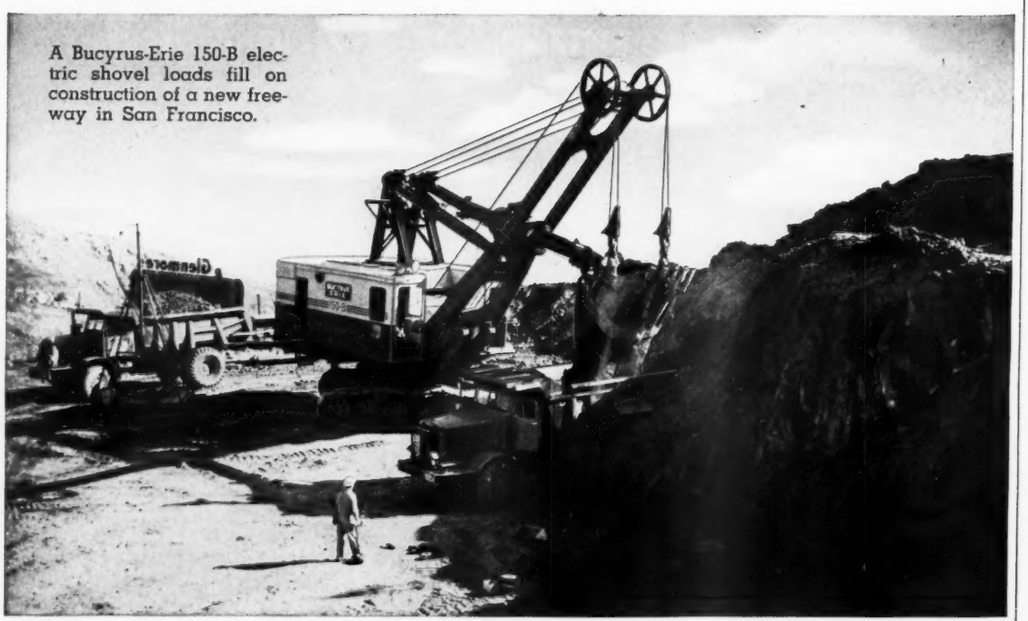
Several portions of the building, including the gymnasium, swimming pool, locker rooms, and corridors, were constructed of conventional reinforced concrete. Square concrete columns were formed with vertical 1-inch lumber cleated with short pieces of 2 × 4 and lined with ¼-inch plywood. These forms were held square with two Universal column clamps, but were tied with Bull Winch column clamps consisting of a flexible metal strap and a locking device, which is tightened by a wrench. The strap is rolled on a spool. The dog that locks the strap in place is easily disengaged with a claw hammer so that the forms can be stripped.

Beam bottoms and some of the flat-slab sections of the roofs were formed with Universal form panels supported on Ceco steel-form joists. The joists were either supported on the columns, on Safway tubular scaffolding, or on Acrow adjustable steel shores. The average roof section was of pan-and-joist construction. The Ceco 12 × 30-inch and 8 × 30-inch pans were supported on 2 × 8 joist bearers laid flat. Acrow shores carrying 4 × 4 form joists completed these roof forms. Ceco pans were furnished and placed

In California . . . And the World Over

BUCYRUS-ERIE WARD LEONARD ELECTRIC SHOVELS

Help Put The Lid On Rising Costs



A Bucyrus-Erie 150-B electric shovel loads fill on construction of a new freeway in San Francisco.

In every design and construction feature Bucyrus-Erie Ward Leonard electric shovels are built to save you money. They have the capacity and performance ability to deliver high output at an economical cost per yard.

Modern front-end design eliminates dead weight, lets power work effectively swinging payloads. Boom strength is greatest where it's needed most to withstand digging and swinging stresses. Ward Leonard control results in fast acceleration and deceleration, provides extra torque and ample usable power. Heavy-duty construction keeps maintenance costs down and adds years to machine life.

All over the world — in mines, in quarries, and on big construction projects — Bucyrus-Erie Ward Leonard electric shovels are being used to handle the toughest digging and loading assignments. Those who use them know that Bucyrus-Eries, with their fast operating cycles and durable construction, provide the dependable high-output and low-cost performance that means profitable operation.

58L55

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

75 Years of Service to Men Who Shape the Earth

For more facts, use Reader-Reply Card opposite page 18 and circle No. 358

by Ceco Steel Products Corp., Houston.

In the swimming-pool area, the sloping floor and the distance from this floor to the roof complicated the shoring problem. Here and in the gymnasium a combination of Safway scaffolding and Acrow shores supported the roof forms.

Ready-mix concrete for the conventional reinforced-concrete sections was supplied by Parker Bros. & Co., Houston. The Northwest crane and a Gar-Bro ¾-yard bucket made the column pours. Concrete for the roof pours beyond the reach of the crane was wheeled into place in buggies, and Wyco electric vibrators were used on all these pours.

The large auditorium at the front of the school was framed entirely with structural steel set by the Northwest crane. Long steel trusses span the auditorium from steel columns on both sides. Steel bar joists run between the trusses and support the Perlite roof, which was poured on Pittsburgh Steeltex paper-backed floor lath.

Outside walls of the building are of brick and tile, and most interior walls are tile, cut to the required sizes and shapes by a Clipper masonry saw. Incidental work included the construction of stabilized shell roads, concrete sidewalks, concrete tennis courts and play areas, and the surfacing of the football field and baseball diamond with black dirt.

Personnel

Plans for the building were prepared by architect Stayton Nunn of Houston, who was represented at the job by Richard B. Walton. Coordinating architect on the bond-issue program, which included this and other school improvements, was Milton McGinty. During most of the job, 100 to 150 workmen were on the payroll, working five 8-hour days. Supervising the operation for Farnsworth & Chambers Co., was L. W. Branch, superintendent. Lift Slab superintendent was L. F. Renegar.

THE END

Concrete curing

■ A brochure from American Sisalkraft Corp., 55 Starkey Ave., Attleboro, Mass., titled "Curing and Protection for Better Concrete", defines and explains the methods and application of concrete curing. Ways of curing—by means of burlap, ponding, chemical membrane, sand, sprinkling, straw, and waterproof paper—and their results are listed in a chart. Diagrams and on-the-job photos are included.

To obtain this brochure write to the company, or use the Request Card that is bound in at page 18. Circle No. 196.

Le Roi sales appointment

Edward R. Couch has been appointed manager of stationary compressor sales for the Le Roi Division of Westinghouse Air Brake Co., Milwaukee, Wis. He will assist with sales promotion and work with field personnel.

Scalpel? Hammer? Chisel?

PUNCH-LOK

Please!

PUNCH-LOK HOSE CLAMPS

No Snag . . . No Leak . . . No Wear . . . No Tear

"The Sign of a GOOD Hose Clamp"

Dr. Punch says, "When Mr. Lok locks 'em they stay locked!"

See your nearby Punch-Lok Distributor—or write today for product and price information.

PUNCH-LOK Company

5634

Dept. J, 321 North Justine Street, Chicago 7, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 359

Wain-Roy BACK HOE on International TD-9 handles difficult job in... 1 hr. 20 min.

Excavation measured 5' wide, 3½' deep, 14' long. Time, 1 hr. 10 minutes.

Tank was placed into position by hoe in 7 minutes and then backfilled in 3 minutes.

You can make money fast when a Wain-Roy Back Hoe is on the job, like this contractor did on a tank installation job. Digging through 8" of frost, the hole measuring 5'x5½'x14' was neatly excavated in only 1 hour and 10 minutes. Serving as a crane, the 3½' diameter x 12' tank was speedily lowered into the excavation and backfilled in another 10 minutes.

Wain-Roy Backhoes are designed for both TD-6 and TD-9 tractors . . . are attached or removed in less than 10 minutes . . . do not interfere with front shovel or bulldozer attachments . . . dig at right angles . . . and provide digging depths down to 12'-2".

PAYLOADER® mounted Wain-Roy gets around on any ground

Where maximum mobility is desired . . . from job to job without trailers . . . or work on paved surfaces is necessary, PAYLOADER WAIN-ROY combination is the answer.

Ideal for digging vertical bell holes as small as 14" wide x 42" x 7' deep as shown at left, or larger buckets up to 36" available. Digs at right angles, with PAYLOADER parallel to street to avoid traffic interference. Digging depths to 12'-6". Wrist action bucket cuts square corners, vertical sides, smooth level grade. Shovel bucket used for backfilling. A real time and money saver on any trenching or excavating job. Get complete details from your I-H dealer.

Wain-Roy CORPORATION

Originators of the Hydraulic Tractor Mounted Back-Hoe

Hubbardston, Mass.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 360

". . . or he yanks 'em right off the job."

The Electrall generator can provide 60-cycle power rated at 12,500 volts wherever a truck can travel.

Portable generator mounts in truck bed

■ A portable heavy-duty electric generator which mounts in the bed of a pickup truck and operates by power takeoff from the truck's engine is announced by the Motor Truck Division of International Harvester Co. The unit has an output of 12,500 volts.

A compact unit weighing only 325 pounds, the Electrall generator makes standard 60-cycle power available anywhere a truck can travel. It features plug-in outlets for 110 or 220-volt single-phase, or 220-volt three-phase, alternating current. It is recommended for operating drills, pumps, welding equipment, compressors, space heater, and lights.

The Electrall generator is factory-installed optional equipment on International Series R-110, R-120, and R-130 pickup trucks, and is also available for installation on larger models. The unit is belt-driven by an independent power-takeoff gear from the transmission and controlled from the instrument panel of the truck. It is said to handle up to a 10-hp motor, depending on the application.

For further information write to the Motor Truck Division, International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 160.

Mixer with supply tank

■ The portable HTD 800 mixer with asphalt supply tank is the subject of a mailing piece from K. E. McConnaughay, 424 Columbia St., Lafayette 2, Ind. According to the literature, the mixer has capacities of up to 10 tons per hour for hot-mix and up to 30 tons per hour for cold-mix. Overall dimensions are 84×180×110 inches; weight, 5,600 pounds; horsepower, 25 at 2,400 rpm; and fuel-tank capacity, 60 gallons.

To obtain this mailing piece write to the company, or use the Request Card at page 18. Circle No. 197.

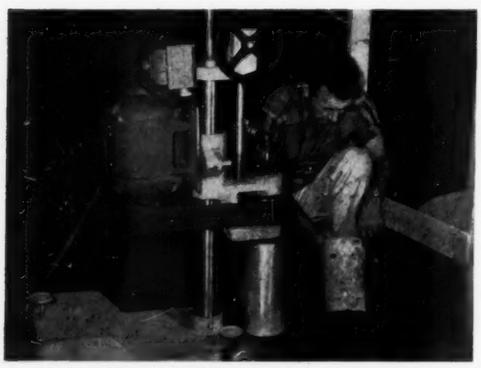
Portable asphalt plant

■ A batch-type asphalt plant, the Mobile 40, with 100 to 120-tons-per-hour capacity is shown in a mailing piece from Hetherington & Berner Inc. This portable plant has all units wheel-mounted, permanently installed piping and wiring, and remotely located electric driven units, and needs no crane for erection. A diagram of the plant is included.

To obtain Bulletin M-40 write to Hetherington & Berner Inc., 701–745 Kentucky Ave., Indianapolis 7, Ind., or use the Request Card at page 18. Circle No. 188.

molco

NEW AND BETTER METHODS



DRILL CLEAN ACCURATE HOLES IN MASONRY AND REINFORCED CONCRETE WITH *DIAMONDS!*

Lightweight, portable Mechanized Mole drills clean holes in any hard aggregate building material including the steel reinforcing bars in concrete. Excellent for running piping and conduit, anchoring vertical & horizontal steel members; cutting test cores. Hand equipment also available.

Molco thin walled diamond bits are also available from 1/2" to 12" O.D.

DRILL, BREAK AND CHISEL WITH SELF-POWERED MOTORBORR

A unique method of breaking and drilling stone, concrete, brick and asphalt. Gasoline powered and completely self-contained this 86 lb. Motorborr can be easily handled and transported by one man. Will drill up to 13 ft. depth. Be sure to write today for literature and prices!

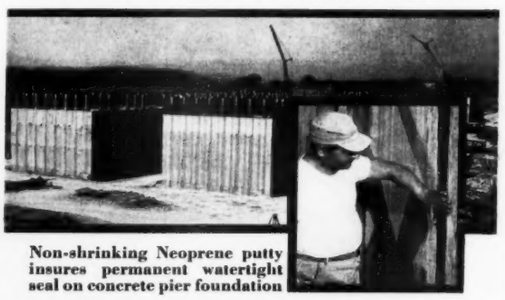
4 point detachable TUNGBIDE rock bits assure maximum drilling life.

molco drilling machines · inc

1100-20TH STREET NW · WASHINGTON 6 DC · ME 8-6811

For more facts, circle No. 361

GACO NEOPRENE PUTTY MAKES CONCRETE BOXES WATERTIGHT



Non-shrinking Neoprene putty insures permanent watertight seal on concrete pier foundation

Eight buoyant concrete caissons serve as pier foundations for the New York State Thruway Tappan Zee bridge. GACO N-92 neoprene putty was specified for sealing construction joints. This synthetic rubber putty is self-curing, provides superior adhesion to concrete and metal, resists weathering and water, and is applied with caulking gun or trowel. Gaco N-92 is ideal for sealing retaining walls, sewer joints, expansion joints, and deck-to-abutment bridge joints. Write for details.

THE MARK OF CORROSION PROTECTION

GATES ENGINEERING COMPANY

Wilmington 99, Delaware

PIONEER LEADER IN PROTECTIVE COATINGS

Authorized Distributors in principal cities U.S.A. • Australia • Belgium • England • Finland • France • Israel • Japan Norway • Okinawa • Philippine Islands • Puerto Rico • Sweden. In Canada: Gaco Products Ltd., Brantford, Ontario.

For more facts, circle No. 362

Sheppard DIESEL

is interchangeable with popular size gasoline engines

20 H.P.

2000 R.P.M.

Model 17

Wherever the operating economy and stamina of Diesel power is required . . . the Model 17 replaces popular size gasoline engines with practically no machine alterations or design changes. Available with complete drive including transmission or torque converter. Write today . . . outline briefly your power needs.

Fits into same space as a gasoline engine

Low Weight to power ratio

New Low in Diesel PRICE

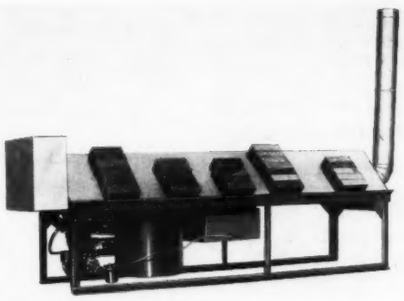
21¼" wide
30¾" high
33" long

SHEPPARD DIESELS

HANOVER 6, PENNSYLVANIA

BUILDERS OF DIESEL ENGINES, TRANSMISSIONS, REAR AXLES AND POWER STEERING UNITS FOR INDUSTRY

For more facts, circle No. 363



BRICK WORK NEED NOT BE HALTED during the cold-weather months if this Meyers brick warmer is put to use on the building project. Designed to heat from 600 to 800 bricks per hour, the warmer is built of 14-gage steel and uses a Delco oil-fired pressure burner. According to the manufacturer, preheated bricks allow mortar to set properly and prevent it from running out of the joints. For further information write to D. W. Meyers Mfg. Co., Seville, Ohio, or use the Request Card at page 18. Circle No. 473.

Konkure Concrete Curing Compounds

For twenty years never a City, County, State or Federal test failure . . . *There must be a reason!!!*

YOU PAY NO MORE FOR THE FINEST OF CONCRETE CURING COMPOUNDS

★ *KONKURE NOW OFFERS:*

- Clear—Black-Gray and White Pigmented-Resin Tilt-Up . . . Specified in Original Bureau of Reclamation Specifications.
- Concrete Sawing, Joint Filling and Curing Application for Airports, Highways, Commercial, Engineering Projects.
- Specify KONKURE . . . Specify the Cadillac of Concrete Curing Compounds.

★ *OTHER KONKURE PRODUCTS . . .*

- KONSET . . . A Hardener and Stabilizer for Topping and Bonding Old Concrete to New.
- KOLORBLEN . . . Concrete Coloring . . . A Variety of Colors.
- SERVICISED EXPANSION BOARD . . . Full or Cut.
- RUBBER WATER STOPS . . . PARAPLASTIC Joint Sealer, Regular and Para-Plastic JFR.
- Western States Distributor for Block Mesh.

DEALER INQUIRIES INVITED

WRITE TODAY FOR FULL INFORMATION

KONKURE COMPANY

Concrete Curing and Application

6742 STANTON AVE. P. O. BOX 336, BUENA PARK, CALIF. PHONE LAWRENCE 2-2841

Material handlers

■ Caterpillar Tractor Co., Peoria, Ill., has issued a booklet showing the contractor what Caterpillar material-handling machines will help him on a job. Actual customer jobs and action shots of the equipment at work emphasize the outstanding features of the company's Traxcavators, wagons, dozers, and motor graders.

To obtain Booklet No. D565 write to the company, or use the Request Card at page 18. Circle No. 187.

Insulator bridge pads

■ Fabreeka Products Co., Inc., has put out a folder illustrating insulator bridge pads that are said to absorb impact shock and vibration. Complete specifications, pictures, and diagrams of Fabreeka pads for use under water mains, expansion joints, and on bridges is given.

To obtain this folder write to Fabreeka Products Co., Inc., 222 Summer St., Boston 10, Mass., or use the Request Card at page 18. Circle No. 169.

"Is it too late, Doctor?"

It's *not* too late for Americans who go to their doctors at the *first sign* of any one of cancer's 7 danger signals: (1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

Guard yourself against cancer. Phone the nearest office of the American Cancer Society or simply write to "Cancer."

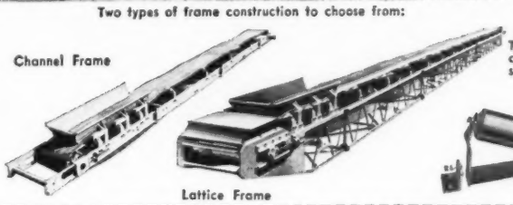
American Cancer Society

For more facts, circle No. 364

Whatever **your material-moving job**

A Universal radial stacker installation for stockpiling.

Two types of frame construction to choose from:

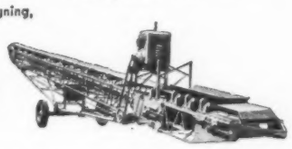


Channel Frame

Lattice Frame

Triple troughing roll with self cleaning mounting and self aligning, sealed for life bearings

Universal Portable Conveyor with hydraulic hoist



there's a **UNIVERSAL CONVEYOR** that does it for less

Sectionalized construction and simple, flexible design are the main reasons for Universal Conveyors' low cost and versatility. Head sections, intermediate sections in many lengths, and tail sections are combined with Universal's complete line of conveyor accessories to handle any job efficiently and economically. Simple design makes it easy to set up, move, or alter your Universal Conveyor for different jobs.

Universal offers these quality features assuring you extra years of use and low cost maintenance.

- Anti-friction, sealed for life, or grease-type bearings
- Self cleaning mountings and tail pulleys
- Adjustable belt flashings
- Screw or Gravity type take up to maintain belt tension
- Lagged drive pulley
- Extra heavy cold rolled shafts

Send for free literature. For greater savings, ask for information on Universal's assemble-yourself Pre-Fab Conveyors.

PETTIBONE UNIVERSAL In Cedar Rapids Since 1906

Whatever your material moving requirements, there's a Universal Conveyor to do the job profitably. And Universal's complete engineering services are available to design your installation.

UNIVERSAL ENGINEERING CORPORATION

620 C Avenue NW, Cedar Rapids, Iowa

Gentlemen: Please send me information on —

☐ Universal Conveyors ☐ Universal Pre-Fab Conveyors

☐ Radial Stackers ☐ Conveyor Engineering Service ☐ Conveyor Idlers

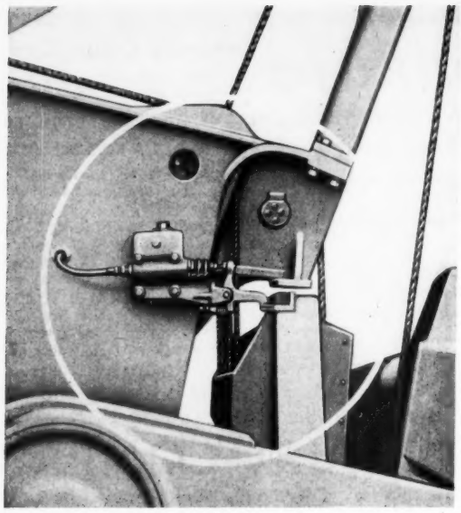
Your Name

Company Name

Address

City State

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 365



The ejector master cylinder actuates a slave cylinder and forces the cable control lever to hold position when the ejector approaches its limit of travel.

Proper care extends useful life of cable

Good maintenance practices and a good operator can extend the useful life of a cable, generally considered an expendable part of a scraper or cable-controlled bulldozer.

Daily checking of the cable drum will prevent breakdown, as the drum is the prime area of wear. Kinked cable, caused by improper operation of the cable control, may be straightened out before the cable is severely damaged; but frayed cable results from a bent or misaligned sheave or ejector roller that is not turning freely. Proper lubrication of sheaves and rollers will keep them turning freely and prevent the cable from sliding.

When a new cable is installed on the scraper, at least two wraps of ejector apron cable on the control drum are necessary when the scraper ejector is at the extreme rear position with the apron down. There should be at least five or six wraps when the bowl is at ground level.

The cable should be kept under tension when the scraper bowl is being lowered to the ground or when the cutting edge is set for digging. The ejector will normally move the material out of the scraper rapidly, but the cable should not be overstressed. As the apron is forced upward by the dozing action, take up the slack in the cable and then let out enough to adjust the position of the apron.

Cable savers such as hydraulically connected master and slave cylinders are recommended for field use as aids to operation and as extenders of cable life.

Handbook on motor trucks available in new edition

The 1955 edition of "Motor Truck Facts," a companion to "Automobile Facts and Figures," the annual statistical handbook published by the Automobile Manufacturers Association, contains some 50 pages of charts and tables covering commercial vehicle factory sales and production, mileage, commodities shipped by truck, taxes, employment, and other data.

One-third of all special automotive taxes levied, the booklet reveals, are being paid by truck operators. Yet trucks comprise only 17 per cent of the motor vehicles in the U. S. and account for only 18 per cent of the total vehicle mileage on the nation's streets and roads.

In 1954, the booklet states, special truck taxes reached an all-time high of $1,771,483,000. This included federal excise taxes, state registrations and carrier fees, state gasoline taxes, and local taxes and tolls. This year, it is estimated, the tax total will reach $1,850,000,000.

The booklet contains a table on truck registrations from 1904 to date, showing that the number of trucks in the nation will exceed 10 million this year for the first time in history. This is twice the 1945 total.

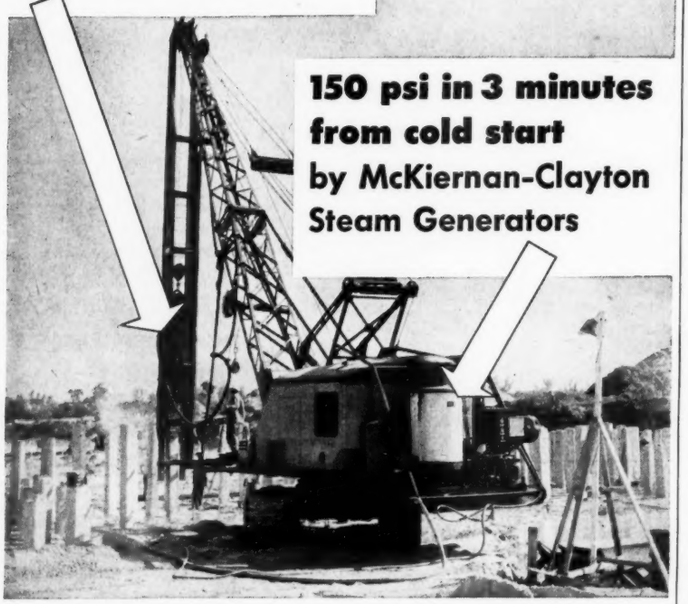
Copies of the booklet are available free of charge from Automobile Manufacturers Association, New Center Bldg., Detroit 2, Mich.

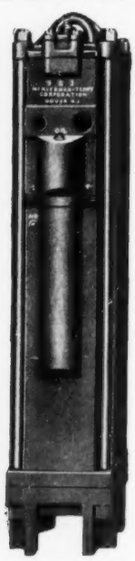
Huber-Warco appoints sales representative

Huber-Warco Co., Marion, Ohio, has appointed John McCaffrey district sales representative for seven western states, two Canadian provinces, and Alaska. He will handle the firm's line of graders, tandem rollers, and three-wheel rollers from headquarters at 436 Minton Court, Pleasanthill, Calif. Idaho, Utah, Montana, Washington, Oregon, California, Arizona, and the provinces of Alberta and British Columbia are in his territory.

Driving 200 piles per 8-hr. shift by two McKiernan-Terry Pile Hammers

150 psi in 3 minutes from cold start by McKiernan-Clayton Steam Generators





McKiernan-Terry 9B3 Double-Acting Pile Hammer

Paul Smith Construction Co. of Miami, Florida, wanted to make short work of driving 4,000 concrete piles and 14,000 timber piles for the foundation of the Miami Sewage Treatment Plant.

Two McKiernan-Terry 9B3 Double-Acting Pile Hammers, each powered by a McKiernan-Clayton Steam Generator tail-mounted on a crane, did the job at the rate of a pile in less than 5 minutes, including all operations, for the entire lot of 18,000 piles.

No wonder the contractor reported that all the McKiernan-Terry Hammers and McKiernan-Clayton Generators "gave very good service." Write for bulletins on these job-speeding units.

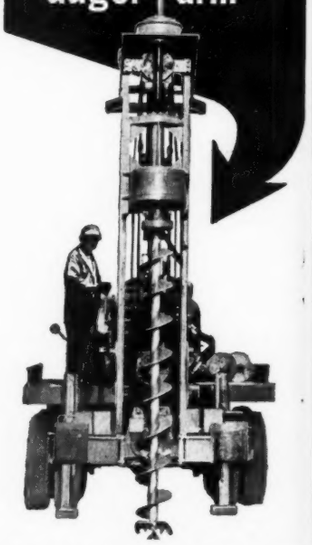
McKIERNAN-TERRY CORPORATION
Manufacturing Engineers
80 RICHARDS AVE., DOVER, NEW JERSEY

McKIERNAN TERRY

MK-388

For more facts, use Reader-Reply Card opposite page 18 and circle No. 366

World's heavy auger | fastest, vertical drill



NEW HEAVY-DUTY McCARTHY drills 8-inch holes 100 feet deep in sandrock in 40 minutes *

* Ohio River Colliery Co., Cheshire, Ohio

This new heavy-duty drill, Model 106-24, is used for blast hole drilling, general exploration, foundation drilling, dewatering operations, deep post holes, etc. Has high-speed take-off for small diameter augers, and low-speed power take-off (3 to 1 reduction) for large diameter augers. Hydraulically operated throttle valve.

AUGER DIAMETER	DEPTH OF BORE
20 INCHES	30 FEET
16 "	40-60 "
12 "	60-80 "
8 " and under	100 "

8" and 9" diameter augers bore through shale and sandrock to produce larger diameter holes for new type explosives. Larger diameter augers bore through shale and hardpan formations. The choice of contractors where the going is tough.

For complete information contact The Salem Tool Co.

Ask for Bulletin M-100

THE SALEM TOOL CO.
806 S. ELLSWORTH AVE.
SALEM, OHIO • U. S. A.

For more facts, circle No. 367

Purdue offers fellowships in civil engineering

Approximately 22 graduate fellowships for the summer session are available at the School of Civil Engineering and the Graduate School of Purdue University. These fellowships carry a stipend of $700 and are made possible by a free grant from the Asphalt Institute, College Park, Md.

Teachers or research personnel in schools or departments of civil engineering are qualified applicants. The program of study, running from June 11 to August 4, 1956, will include graduate courses in bituminous materials, bituminous-aggregate mixture design, and flexible-pavement design. This will be supplemented by a weekly symposium led by authorities in the field of asphalt technology.

Application forms and information may be obtained by writing Professor K. B. Woods, head of the School of Civil Engineering, Purdue University, Lafayette, Ind.

ASTM standards on cement

A new edition of "ASTM Standards on Cement" has been published, presenting the various standards and tentative specifications, methods of chemical analysis, and methods of physical testing pertaining to cement.

Of the 37 specifications and tests, 18 have been revised since the 1954 edition was published and five are new. Two methods published in the previous edition have been discontinued.

The book, one of a series of special compilations of ASTM standards relating to specific materials fields, may be obtained from ASTM headquarters, 1916 Race St., Philadelphia 3, Pa., for $2.75 per copy.

Form coating

A folder describes Stonhard form coating for wood and metal forms. Being brown in color, the coating clearly shows where areas have been treated, and what areas have been missed. According to the company, the substance will not constitute a fire hazard at temperatures up to 200 degrees F, and it makes a tough coating, permitting forms to be stripped easily.

To obtain this folder write to Stonhard Co., 1306 Spring Garden St., Philadelphia 23, Pa., or use the Request Card at page 18. Circle No. 466.

New high in steel tonnage is recorded in 1955

In its year of greatest production, 1955, the steel industry turned out a total of about 116 million net tons of ingots and steel for castings. This was far ahead of the 111.6 million tons made in 1953, the highest previous year, but already the industry is looking forward to prospects for 1956, when new records are expected to be made. At the present moment, the continuing growth in the demand for steel products has caused the industry to step up plans for expansion, and the record capacity of the industry—126 million tons at the start of last year—is expected to be considerably greater before 1956 is over. Employment and wages in 1955 were 680,000 and $3½ billion respectively.

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names in the news

Adm. Meade named chief of Bureau of Yards and Docks

The former director of construction of U. S. bases in Spain, Rear Adm. Robert H. Meade, has been appointed chief of the Navy's Bureau of Yards and Docks. He succeeds the late Rear Admiral John R. Perry.

A graduate of the U. S. Naval Academy, Annapolis, he has served

Rear Adm. R. H. Meade, chief of the Bureau of Yards and Docks.

in several engineering capacities with the Navy. Before World War II, he was officer in charge of construction at the Jacksonville, Fla., air station. Later, he assumed similar posts in Norman, Okla., and in Alaska. During the war, he planned, organized, and directed the construction of air fields in the Philippines.

Adm. Meade was with the Bureau from 1945 until 1950, when he became director of naval petroleum reserves. He was director of construction, Joint U. S. Military Group, in Spain until his present appointment.

Rice succeeds Grover in Jersey highway post

Kenneth D. Rice has been named to succeed A. Lee Grover as secretary and chief clerk of the New Jersey State Highway Department. He had previously served as Mr. Grover's assistant.

Grover, secretary of the department since its organization in 1917, also retired from his position as director of administrative services.

Corps of Engineers appoints N. P. Oglesby

Nicholas P. Oglesby has been appointed chief of the construction equipment section at the Corps of Engineers' research and development laboratories, Fort Belvoir, Va. He is a former test engineer and project engineer for the Corps.

Oglesby succeeds Richard C. Navarin, who became assistant head of the mechanical equipment branch.

Guy B. Panero opens offices in Europe

Guy B. Panero Engineers, New York, N. Y., has opened two European offices, one in Paris and one in Rome.

The Paris office, located in the Chase Manhattan Bank building at 39 Rue Cambon, will participate in the modernization of the American Express building. Large projects in the Middle East will be handled by the Rome office, 6 Via Salandra.

Army engineers officers direct Pakistan building

The building of air, sea, and land defenses in Pakistan will be supervised by the U. S. Army Corps of Engineers, under the immediate direction of Brig. Gen. B. B. Talley, Mediterranean Division Engineer. He will also take preliminary steps to establish a district engineer office in Karachi and five area offices where principal construction projects will be located.

Col. William A. Davis will head the district office.

The work, being done under a Mutual Aid Agreement between the U. S. and Pakistan, will be done with local labor and materials, and no army engineer units will be used.

International Engineering appoints Torald Mundal

International Engineering Co., Inc., a subsidiary of Morrison-Knudsen Co., Inc., San Francisco, Calif., has appointed Torald Mundal vice president and chief engineer of the firm. A graduate of Polytechnic Institute, Trondheim, Norway, Mr. Mundal has supervised planning for the company in India, Canada, and California.

Louis J. Corbetta, project manager for the construction of a U. S. base at Rota, Spain.

Corbetta to direct work on Spanish base

Louis J. Corbetta, secretary and director of the Corbetta Construction Co., New York, N. Y., has been selected project manager of the seaport and fuel-supply base at Rota, Spain.

The $17,372,000 project is being built by a joint venture of Corbetta and Construcciones Civiles, S. A., Spain.

Organizing the job for Corbetta is Charles J. Prokop, who will spend three months in Spain. Wallace J. Buhler, vice president of the Corbetta Equipment Corp., will direct mobilization of equipment for the job.

Ohio Turnpike engineer

Succeeding T. J. Kauer as chief engineer of the Ohio Turnpike Commission is Ralph J. Lehman. The assistant chief engineer since October, 1953, Lehman has been associated with the highway engineering field for the past 25 years.

Portland Cement Assn. re-elects E. M. Ford

Emory Ford has been elected to serve a second term as chairman of the board of directors of the Portland Cement Association, Chicago, Ill., a national organization to improve and extend the uses of portland cement and concrete. Mr. Ford also serves as chairman of the Huron Portland Cement Co., Detroit, Mich., and the Wyandotte Chemical Corp., Wyandotte, Mich.

Harvey Slocum, nonmember winner of the annual Moles award.

King, Slocum to receive annual Moles awards

The awards for "outstanding achievement in construction", given annually by The Moles, a society of outstanding figures in tunneling and heavy construction, will be presented to Howard L. King of New York, N. Y., and Harvey Slocum of Alhambra, Calif. The awards are given to one member and one non-member of the society. This year's member winner is Mr. King.

Mr. King, vice president and chief engineer of Mason & Hanger Co., Inc., New York, is considered to be an expert on compressed air and subaqueous tunnels and has worked on many of the principal underwater tubes serving New York City. A graduate of the City College of New York and of Columbia University, he also holds a Bachelor of Science degree from Massachusetts Institute of Technology.

Howard L. King, award - winning member of the Moles.

A builder of concrete dams, Mr. Slocum has been project manager on the construction of such projects as Grand Coulee, Bull Shoals, and Davis dams. At present, he is in India building the Bhakra Dam.

Formal presentation of the awards will be made at the society's annual dinner at the Waldorf-Astoria Hotel on February 2.

M-C&S executive changes

Richard E. Mynatt has been elected a vice president of Merritt-Chapman & Scott Corp., heavy construction company of New York, N. Y., and will serve as administrator of the firm's construction department. A member of the M-C&S organization since 1938, Mr. Mynatt previously served as office manager, purchasing agent, executive assistant on major projects, and as manager of the construction equipment section.

Heading the recently opened Boston, Mass., office is Charles A. Richardson, former head of the New York Marine & Heavy Construction Division. Prior to his election as a vice president of the company in 1953, Mr. Richardson had been in charge of M-C&S operations in the Boston area. He will be succeeded by Frank R. Creedon in his heavy and marine post.

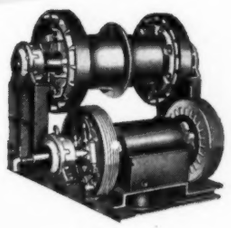
The new director of purchasing is Harry Powell. A member of the M-C&S staff since 1950, he will work in the firm's construction department.

Walter Kidde Constructors elects vice presidents

Frank L. Whitney and E. G. Robbins have been elected vice presidents of Walter Kidde Constructors, Inc., engineers and builders of New York, N. Y., and Houston, Texas.

Formerly the firm's chief engineer, Mr. Whitney will be in charge of engineering. He is both a professional engineer and a registered architect. Mr. Robbins will serve as vice president in charge of construction.

...h MORE Big Shovel FEATURES



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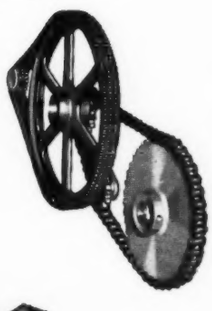

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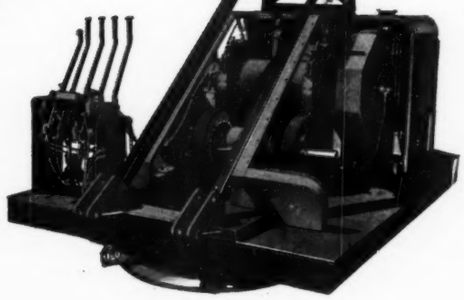

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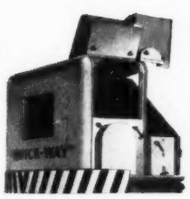
All operating controls, including instrument panel and lock throttle, conveniently located in front of operator. Safety glass windows on all sides and top insure full vision—sliding and hinged windows provide maximum ventilation.



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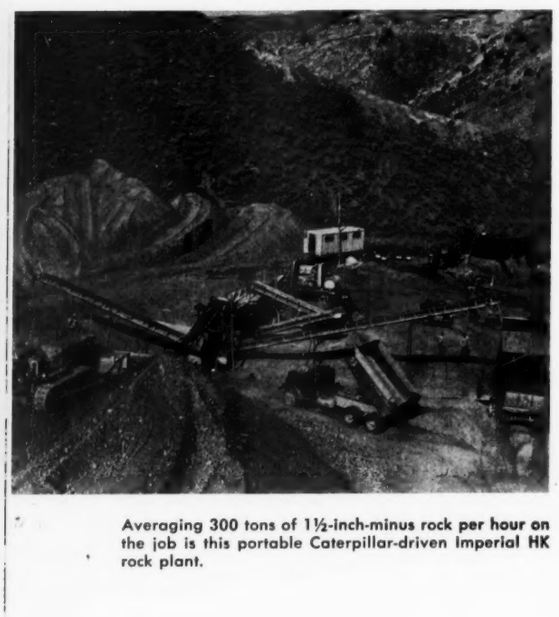
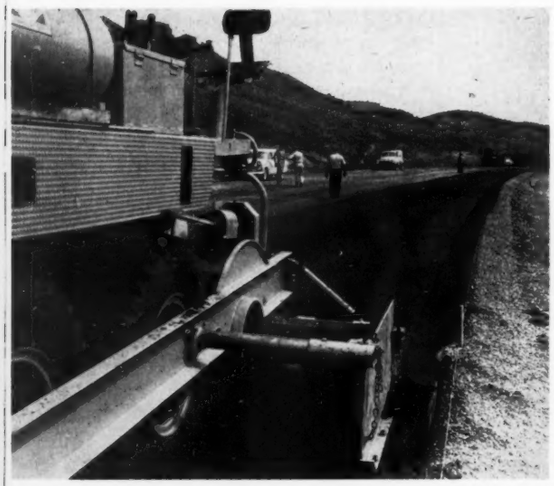
High hot-mix output finishes road job in three months

Production of crushed rock and asphaltic concrete is handled by paver placing 150 tons of material hourly

The Pioneer Model 101 Continuflo asphalt plant, calibrated to turn out 150 tons of material hourly, loads a batch truck while a Cat D8 dozes aggregate to the feeder tunnel. The basic units—a combination dryer and dust collector and the gradation unit and pugmill—are mobile.



Averaging 300 tons of 1½-inch-minus rock per hour on the job is this portable Caterpillar-driven Imperial HK rock plant.

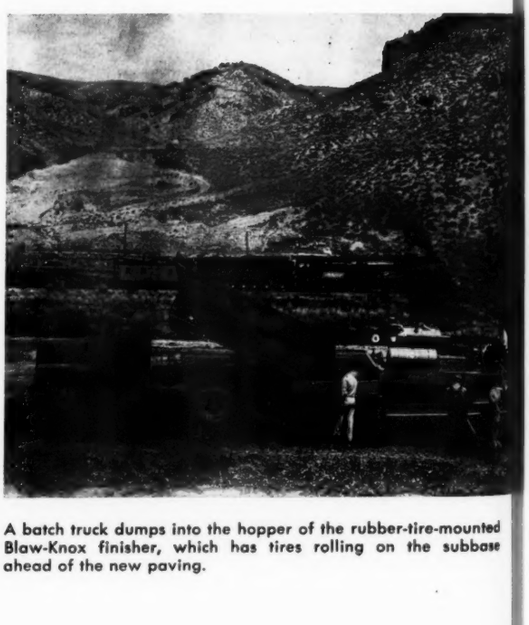


This closeup shows the arrangement of the contractor-built slip form used to make the sloping edge on an outside lane.

Using a paving spread capable of handling the 150-ton-per-hour output of its asphalt plant, Carl E. Nelson Construction Co., Inc., Logan, Utah, completed graveling and surfacing on an 8-mile stretch of U. S. 30-S near Echo City, Utah, in little more than three months. In that time, the firm produced and handled 110,000 tons of 2-inch-minus rock for the surface course, 21,680 tons of Type A plant-mix, and 10,590 tons Type B plant-mix.

The $275,000 project, built for the Utah State Road Commission, replaces an obsolete two-lane highway. Largely on a new location, it has a 24-foot-wide plant-mix asphalt riding surface with 6-foot plant-mix shoulders on either side. The road was built with 12 to 15 inches of 2-inch granular base, 3 inches of leveling-course material, and 3 inches of bituminous plant-mix.

Grading work was let separately late in 1954 to Young & Smith Construction Co., Salt Lake City, low bidder on this item. Starting work late in the fall, the firm pioneered cuts on the steep slopes of Echo Canyon with several Caterpillar D7's and D8's equipped with cable-controlled dozer blades. After an initial pathway had been developed by these machines, the contractor's fleet of Caterpillar DW21's and several LeTourneau-Westinghouse Tournapull scrapers moved in. There was a considerable amount of ripping and minor drilling and shooting necessary ahead of this equipment in some areas. But in general, push-loading excavation of the overburden soil, gravelly cobbles, and softer rock was not too difficult and the rubber-tire equipment had finished work by the time Nelson



A batch truck dumps into the hopper of the rubber-tire-mounted Blaw-Knox finisher, which has tires rolling on the subbase ahead of the new paving.

As the paver moves along, a shop-built shoe, bolted adjacent to the screed on one side of the machine, forms the beveled edge required on the outside of the pavement.

moved in to start the subbase and surfacing jobs.

Rock crusher production

Nelson first set up an Imperial HK crushing-screening plant in the mouth of a canyon only a few hundred yards away from the new highway. This site, about two miles from one end of the project and six miles from the other end, consisted of a heavy alluvial deposit of well-graded sand and gravel, and small cobbles up to about 8 inches in diameter.

Basic components of the Imperial HK plant include an 1836 Cedarapids jaw, two sets of 24 × 40 roll crushers, a 3 × 16-foot screening deck, and a double 3 × 7 screening deck. Caterpillar diesel power is used exclusively in driving the plant. The jaw crusher is driven by a D8800 and the remainder of the plant operates from power furnished by a D-365 diesel-power package. The plant is portable and can travel over the highway or make other moves on its own wheels.

Operating at an average production rate of about 300 tons per hour, the plant turned out 1½-inch-minus material at a crushing ratio of about 30 per cent. Raw material, fed to the plant trap by two Caterpillar D8's with dozers, passed through the primary jaw, and was transferred to the top set of vibrating screens. Throughs meeting specification size limits dropped to a delivery conveyor leading to a 30-ton steel surge bin for loading onto trucks.

Rock particles retained on the vibrating screens passed to a roll-crushing unit, set in a closed circuit with the dual screen, for further reduction. Acceptable material dropped through the screen decks to the delivery conveyor. Rock retained on the last screen deck then had a final roll crushing, which was done with closed-circuit control through the bottom screen deck.

According to plant superintendent Lavon Chatterton, use of the long, narrow screen, which takes material at each end and shakes toward a center outlet, helped increase production, since it tended to increase the screening area.

Specification tolerances of the various sizes of crushed rock put out by the plant were:

Screen size	Per cent passing	
	Gravel base	Gravel surface
2-inch	100	....
1-inch	60–100	100
¾-inch	....	75–100
No. 4	30–60	30–60
No. 10	....	20–50
No. 200	3–10	3–10

	Plant-mix type a	Plant-mix type b
1-inch	100	....
¾-inch	85–100	....
½-inch	....	100
No. 4	45–65	50–70
No. 10	30–50	30–50
No. 200	5–10	5–10

All crushed rock and mineral filler for hot-mix paving material was produced from the one plant setup and required a minimum of both secondary handling and storage. The 2-inch-minus material produced when the plant had been set up was hauled directly to the highway by a fleet of dump trucks, then dumped, blade-mixed with moisture, rolled, and processed quickly. The 3 inches of 1-inch-minus rock was then produced and laid. Production of the coarser-sized filler and finer-sized material for the base course followed.

Asphalt plant setup

The asphalt plant setup consisted

(*Continued on next page*)

Handling 150 tons of hot-mix per hour, a Blaw-Knox pneumatic-tire paver works along a section of U. S. 80 near Echo City, Utah. A shop-built slip form on the machine gives the outside of the lane the beveled edge required for the job.

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THE JAY TAMPER

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Weighs only 240 lbs.

for tamping earth... rock... all types of fill... to uniform 100% Proctor densities

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- Delivers more than twenty-five hundred 1500-lb. impacts per minute
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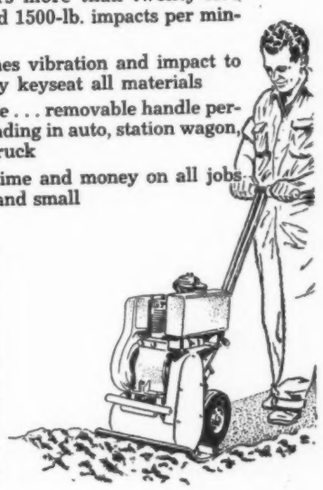
- Saves time and money on all jobs — big and small



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of a 3-year-old Pioneer 101 Continuflo, which Nelson recently purchased from J. H. and N. M. Monaghan, Derby, Colo. The single setup was made only 500 feet from the site of the rock plant.

The Model 101 uses two principal mobile units to make a complete, high-production plant. The first is a combination dryer and dust collector, the second, the gradation unit and pugmill. Power is furnished by General Motors diesels on the dryer and dust collection units, an Allis-Chalmers engine on the screening unit, and a large General Motors engine on the pugmill. Auxiliary electric power for many of the small motors on the plant is supplied by an International UD-18 diesel-electric generating set.

The 100 to 200-penetration asphalt, trucked from the Phillips Petroleum Co. refinery in Salt Lake City, was heated at the site by a Hy-Way hot-oil heater. Two horizontal insulated tanks supplied an 18,000-gallon storage capacity for this material. A 10,000-gallon tank stored fuel for the Ray 1750 burner used on the plant dryer.

One of the conversions made from the stock model arrangement of the plant was a waste bin, in which aggregate rejected by the plant screens were stored temporarily until a truck was available to haul it away. Discharge spouts from the screens routed this rejected material to the bin. Careful control of the storage stockpile of aggregate made it necessary to handle only a minor amount.

Before paving started, the aggregate and asphalt feeds on the plant were checked, and the plant was calibrated for an output of 150 tons of material per hour. Though the plant has exceeded this figure by as much as 50 tons per hour on other jobs, this calibration was considered best for this project. Since the aggregate pile contained about 5½ per cent moisture, and frequent flash rains kept its moisture content slightly higher than average, a drying problem arose, but this was taken care of by the enormous heating capacity of the 101's dryer.

The plant received its aggregate filler as a D8 with dozer shoved the material uphill from its dumping point to the feeding trap. The aggregate stockpile was located over a feeder tunnel having an apron-type machine which put the material onto a Pioneer conveyor. This in turn dumped to the plant dryer. No. 200 fines, pulled out of the dry mix by the dust collector, were dropped through a boot at the base of that unit, and returned by screw conveyor to the bottom of the hot feed elevator. From that point, all the heated material traveled up through the plant screens for sizing.

Asphalt, in its turn, moved in a circulating loop, and was metered through the pugmill in direct ratio to the feed of aggregate. There was no danger of percentages going awry, since an interlocking adjustment held them accurate shift after shift. Indicator lights operated automatically to warn the operator when aggregates in any of the three plant bins reached a low level.

On 5½ per cent moisture removal, the 101 Continuflo plant has had no difficulty maintaining its calibrated average of 150 tons per hour. About 6 per cent asphalt was used to produce a well blended paving mix.

Hot-mix laid fast

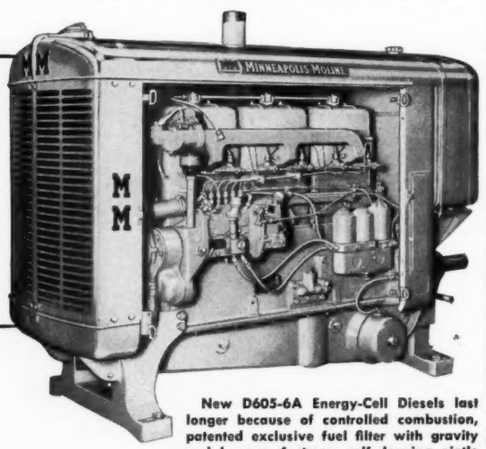
The new Blaw-Knox bituminous paver-finisher, which combines rubber-tire mounting with positive rear-end screed action, placed the hot-mix rapidly. The mounting on the laydown machine consists of 10:00×20 Goodrich tires, two on each side, which carry the machine proper. The loaded hopper receives ground support from three solid Goodrich rubber tires on each side of the machine. All the rubber tires rest on the subbase ahead of the bituminous laydown strip, and since the wheels do not pass over the new pavement, there is no uneven compaction in the lane. The machine, driven by a Hercules engine connected by chain drives to the various wheels, has four forward speeds and one reverse speed.

Bituminous paving material

WHY IT PAYS TO OWN INDUSTRIAL DIESELS WITH REMOVABLE CYLINDER BLOCKS AND HEADS

New MM diesels were developed with *energy-cells* to make them last longer, do more and go farther with less down-time and maintenance.

To provide owners with lower cost maintenance when necessary MM diesels are the most advanced and soundly engineered because the cylinder blocks are cast in pairs separate from the crankcase.



New D605-6A Energy-Cell Diesels last longer because of controlled combustion, patented exclusive fuel filter with gravity and by-pass features, self-cleaning pintle type nozzle, directed cooling of area around combustion chambers.

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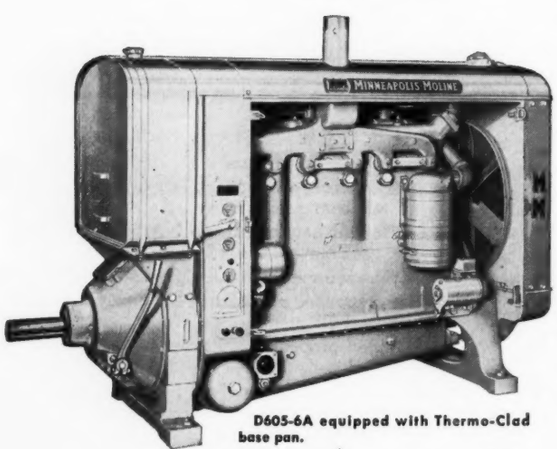

D605-6A equipped with Thermo-Clad base pan.

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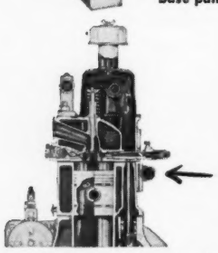
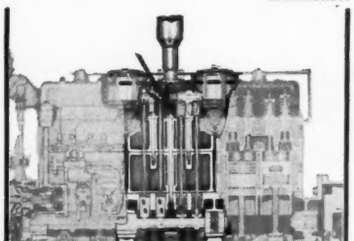
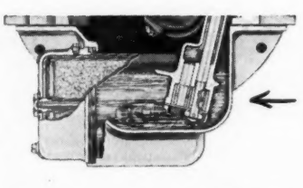
6. Lower initial cost stems from high production parts by casting cylinder blocks in pairs separate from the crankcase.



1. Cylinder head and block assembly shows coolant entrance at hottest point first and extra long skirt wall construction.



2. Close-up of how MM cylinder heads and blocks and crankcase are tied into a single rigid unit with long studs.



3. A D283 feature is extra large oil filter enclosed in base pan, floating-screen oil pump intake, and pump located in bottom of base pan.

Optional Thermo-clad water-blanketed base pans for all units also have oil filter included to give more effective filtering.

INDUSTRIAL MM MINNEAPOLIS-MOLINE MODERN MACHINERY DIVISION

MINNEAPOLIS-MOLINE

MINNEAPOLIS 1, MINNESOTA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 372

TIRES FOR QUARRIES

95% NEW TIRES EQUIVALENT TO 16 PLY MUD & SNOW TREAD COMBAT TYPE 900x20 TIRES

WILL FIT ON YOUR WHEELS WHERE YOU USE 825x20's OR 900x20's

$57.50 FOR TIRE AND TUBE

Ideal for service where you have heavy loads going over rock, stone or any sharp surfaces.

Also available in 1200x20 - 1400x20 and 900x16. Write for free 64 page catalog on tires, tubes and wheels with axles for low beds and dollies. Grader, earthmover tires up to 3000x40. All size airplane tires.

HARMO TIRE & RUBBER CORP.

804 Hammond Bldg., Dept. P.Q.

Detroit 26, Michigan

For more facts, circle No. 373

dumped from trucks entered the front hopper of the paver, and was conveyed in a thin sheet toward the rear distribution auger, which is positioned just ahead of the tamping plate and screeds. Heated by a Sutton oil-fired blower, the screed and tamping bar leave a smooth, evenly distributed lane of material behind.

On this job, paving widths were 12½ feet on the bottom course, and a beveled edge was required. For this, mechanics rigged up a shop-built slip form which they bolted to the side of the machine, even with the screed. It worked perfectly, turning out a sloping edge which matched the shoulder subgrade alongside. The opposite side of the lane was finished square by the side of the machine.

Keeping production at a high level on all three operations—rock production, pavement mix, and laydown work—Nelson was able to complete the project rapidly, freeing the equipment for other work before fall weather set in.

Personnel

The job was designed and was under the general supervision of the Utah State Road Commission, engineering being headed by E. G. Johnson, chief engineer. L. H. Fairless, general superintendent for Carl E. Nelson Construction Co., Inc., was in charge of field work for the contractor. THE END

Powder Power Tool news

Guy Sabin has been made national sales manager of Powder Power Tool Co., Portland, Oreg., manufacturer of cartridge-activated building tools. The firm was recently bought by Oregon industrialist Joseph B. Cox.

Sabin, former Portland branch manager for Homelite, makes his headquarters in the factory offices at 5001 S. E. Johnson Creek Blvd., Portland.

First widened section of Jersey pike opened

Last month saw the opening of the first widened section of the New Jersey Turnpike, a 13-mile southbound stretch from the new Pennsylvania connection to North Camden, which provides three full lanes for vehicles and a wide stabilized shoulder.

Altogether, a total of 61 miles of four-lane sections, from Woodbridge to Camden and from the George Washington Bridge interchange to the Lincoln Tunnel interchange, is being widened to six lanes. Most of the work between Woodbridge and Camden is done. A four-mile stretch from Secaucus to the George Washing Bridge interchange, involving special soil problems, is expected to be ready for use by spring.

Extensive protective measures for workers and motorists are being taken while the job is in progress. These measures, which were incorporated in the specifications for the work, include such innovations as the use of a continuous reflectorized barrier curb at the edge of the pavement excavation, and the use of flares, flags, flashing lights, and signs with oversized lettering. These devices, together with uniformed guards, give motorists ample warning of construction work ahead on the road.

All work is prohibited on travel lanes between noon Friday and noon Monday, and during holidays. At no time is the roadway closed or traffic detoured across the median strip because of work being done.

Ottawa Steel Division buys Tracto-Lift Co.

The Ottawa Steel Division of L. A. Young Spring & Wire Corp., Ottawa, Kans., has bought the assets of the Tracto-Lift Co., Kansas City, Mo.

The Tracto-Lift will now be made in Ottawa's home plant, supplementing a line of hydraulically operated tractor-loader equipment and other types of hydraulic construction machinery.

The former president of Tracto-Lift, Ernest C. Jones, has joined Ottawa Steel's sales force as a factory representative in the fork-lift division.

Don't forget to make your New Year's resolutions right now.

NOTICE TO BUYERS OF NEW
ROTARY SWEEPER
BROOM CORES

We Manufacture NEW Cores of the following types:

★ LITTLEFORD ★ DETROIT-HARVESTER
★ HOUGH ★ CRACE ★ ROSCO
★ FORDSON ★ SPEARSWELL ★ LULL
★ HUBER ★ MELI-BLUMBERG

(Special Cores Made to Order)

We Rebuild Repair all Makes Types-Sizes

Immediate Shipment SAVE MONEY

Suggestion! Buy Cores without any filling or we can furnish filled with steel spring wires—Bass—Palm or Hickory Fibres.

ROAD BUILDERS IT'S SENSATIONAL! !

BIG PECKERWOOD BIG

Steel (or Fibre) road drag levelers
Made in any c-o-n-t-i-n-u-o-u-s length up to 12 feet.
6 inches wide—kiln dried hardwood

NO FRAME REQUIRED

We offer also (not illustrated) The LITTLE PECKERWOOD unit steel wire drag 3" x 15". Fits standard frame

Road Contractors Headquarters Since 1928
VAN BRUSH MFG. CO., INC.
327 Southwest Blvd., Kansas City 8, Mo.

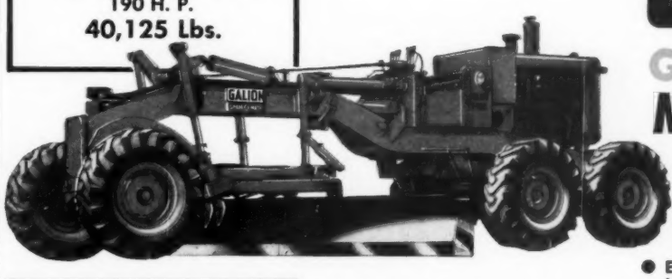
For more facts, circle No. 374

SMASHING PERFORMANCE RECORDS!

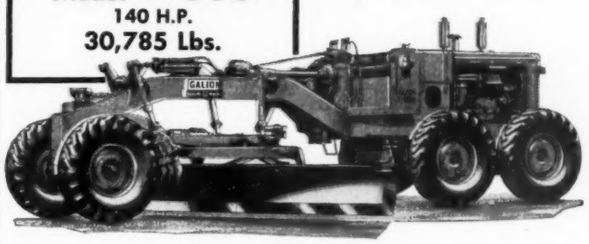
WEIGHT FOR WEIGHT
GALION
GRADE-O-MATIC* MOTOR GRADERS

Give you most "PUSH-POWER" at the BLADE Where it counts!

Model T-700
190 H. P.
40,125 Lbs.



Model T-600
140 H.P.
30,785 Lbs.



Model T-500
125 H.P.
25,000 Lbs.

(Each weight with Scarifier)

*Utilizing a Torque Converter and Power-Shift Transmission.

- Engineered balance of power, weight and blade pressure — prevents useless spinning of drive wheels, moves more material, in quicker cycles, with less operator fatigue.
- GRADE-O-MATIC Drive provides tremendous torque multiplication — automatically as needed; absorbs load shocks, prevents engine lugging and stalling.
- GRADE-O-MATIC Drive eliminates the foot clutch and provides effortless, automatic gear shifting — on the go — while moving in either direction.
- GRADE-O-MATIC Drive automatically adjusts engine speed to meet all loads or conditions — at any predetermined working or travel speed.

THE LAST WORD IN GRADER PERFORMANCE and VALUE

"PUSH-POWER" at the blade is the power that counts in rating the efficiency and work production value of a motor grader. With this kind of smooth, shockless power transmission, effortless shifting, and balance of weight to horsepower, you get more work done — easier — than you ever thought possible.

You'll never believe a Galion GRADE-O-MATIC Grader does so much until you own one and put it to work.

OTHER GALION MOTOR GRADERS
Models 118, 104, 450, 303, 503.
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ESTABLISHED GALION 1907

MOTOR GRADERS · ROLLERS

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THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.
Cable address: GALIONIRON, Galion, Ohio

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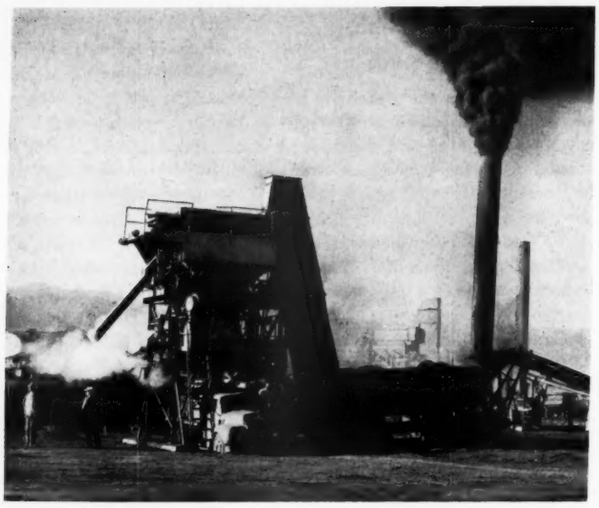
Road reconstruction done as series of small jobs



A dual hot-plant setup, consisting of a Madsen 2,000-pound batch plant (left) and a 2,000-pound Standard hot-plant, produces 1,200 tons per 10-hour shift. The plant uses a special set of burners to reduce steam requirements.

Working on a 16-mile four-lane reconstruction project as a series of small jobs rather than as one large job, a contractor pushed the work toward speedy completion. Three spreads—grading, subbase construction, and paving—were concentrated in assembly-line fashion, and by finishing one section at a time, Germer, Abbott & Waldron Construction Co., Tremonton, Utah, established the key to the job's efficiency.

The project, involving major reconstruction of U. S. 91 between Beaver and Cedar City, Utah, was directed by the Utah State Roads Commission and called for grading, drainage items, a shoulder-to-shoulder subbase course, plant-mix bituminous paving, and a seal coat. The $805,100 contract was started June 1, 1955, and V. C. Mendenhall Co., Inc., Las Vegas, Nev., subcontracted bituminous-paving work.

The 40-foot-wide bituminous pavement includes a main 24-foot riding surface with 8-foot shoulders along both sides, straight alignment, and excellent sight distances.

Grading and structures

Before any other work could be done, the dozers had to clear the desert rangeland of its sparse vegetation. Installing corrugated metal pipe culverts, building several concrete drainage structures, and grading followed in close order.

The main grading item consisted of 375,000 cubic yards of dirtmoving, of which about 50 per cent was side borrow material. Use of side borrow, according to state engineers, placed the roadbed several feet above the adjacent terrain and will foster natural drainage and snow removal.

TDA® BRAKES

if it moves...we can stop it!

equal forward and reverse torque output

Both shoes are applied evenly with equal force and stopping action through a single, straight bore wheel cylinder.

only 8 different parts,

exclusive of wheel cylinder, the superior "DH" brake design reduces parts inventory and simplifies maintenance . . . actually 40% fewer parts than most competitive designs.

"DH" DUPLEX HYDRAULIC BALANCED BRAKE

designed for heavy-duty service

Greater safety, immediate response, less maintenance and easier servicing are all a part of this rugged new hydraulic brake.

Highly efficient, the "DH" brake is basically a self-energizing two-shoe brake in which both shoes do an equal share of the work . . . and are applied to the brake drum with equal effectiveness in both forward and reverse directions. Floating shoe design eliminates heel and toe clearance problems.

Far simpler, the "DH" brake has actually 40% fewer parts than most competitive designs. This results in smaller parts inventory and easier servicing.

The "DH" brake has already met overwhelming acceptance from many leading manufacturers and operators. Efficiency and design advantages are winning new uses for the "DH" brake every day.

"DH" Series Hydraulic Brakes are available in a broad range of capacities and sizes . . . to meet a variety of operating needs.

For additional information . . . with expert consultation, contact the Timken-Detroit® Brake Division. Complete details and specifications on the "DH" brake are available. A staff of experienced engineers is ready to assist you with any brake problem you may encounter.

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For every industrial, agricultural or automotive application where braking is required!

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

TIMKEN Detroit BRAKES
TIMKEN-DETROIT BRAKE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
ASHTABULA OHIO
Accepted D A Standard
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 376

BATTERY AD-X2*
ADDITIVE
FOR YOU
After 7 years' testing in large industrial accounts,
AD-X2
is available to contractors

A California plywood manufacturer says: "We saved $4,095 initially by **AD-X2** treating our batteries."

A Kansas transportation company says: "We cut our battery costs by 60% for the past four years by treating with **AD-X2.**"

A California police radio engineer after 7 years' experience: "If new batteries are treated with Battery **AD-X2**, the life expectancy will be extended two and a half times the normal life."

Pennsylvania contractor: "We have used and sold 25,800 treatments of Battery **AD-X2** since 1951. Our batteries last 2 to 3 times longer with **AD-X2** than without."

TREATMENT: AUTOMOTIVE BATTERY, 6 VOLT or 12 VOLT.... $3.00

$27.00 PER DOZEN
$3 May Save You $30.90!
ORDER NOW

Treatment Good for Life of Battery. Easy to Apply.

Do It Yourself. Like pouring sugar in coffee.

Some territory open — local dealers wanted.

JESS M. RITCHIE, President.

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* Registered. 'U. S. Patent' Office

For more facts, circle No. 421

The soil in general is desert formation ranging from sandy gravel to sandy loam. It loaded well and, when mixed with its optimum moisture content, laid down easily in the fills with good compaction results.

For the grading assignment, Germer, Abbott & Waldron used three Caterpillar D8's with scrapers. An International TD-24 loaded these units. Auxiliary equipment included motor graders, sheepsfoot rollers, and several 2,500-gallon water trucks. Tournapulls hauled much of the side borrow and were used to a limited extent on grading.

Fast subbase production

Germer, Abbott & Waldron achieved high-speed production on one of the biggest items in the project, the 175,000-ton subbase, by using a completely new rock plant. Through Rocky Mountain Machinery Co. of Salt Lake City and Pocatello, Idaho, Germer obtained a new Universal TwinDual rock plant which turned out as much as 600 tons per hour on production of 2-inch-minus base-course material at a crushing ratio of approximately 10 per cent. On production of 1-inch-minus top-course rock, where the crushing ratio is about 30 per cent, the plant has hit 400 tons per hour.

The plant, operating from two pit setups a short distance from the new highway, did its reduction and gradation job in four steps. In a preliminary stage, pit-run material was dropped through a triple-deck screen, so that all pit-run fines already meeting specification size requirements could be shifted to the 23-yard surge bin, from which trucks were loaded.

The remaining stone passed through a jaw-crusher for the first reduction. In the second stage, the material passed over a roughing deck and roughing rolls, and in the third and final stage, the remaining material passed over a finishing screen deck and finishing rolls.

Material was started through the plant by a D8 and a TD-24 tractor, which dozed raw material from the pit to a feeder trap. A 36-inch heavy-duty Universal plate feeder, positioned at the bottom of the trap, placed the raw material on a 36-inch 60-foot input conveyor set on a 30-degree slope. This conveyor was driven by a General Electric motor, powered by a 100-kw generator driven by a Murphy diesel engine. This generating set drove all electric motors in the plant.

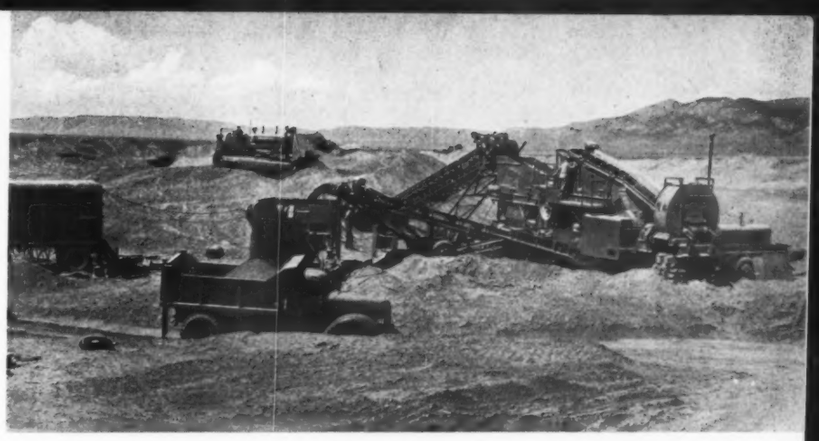
From the input conveyor, material dropped to a triple-deck screen for preliminary sizing. The upper decks of this screen consisted of 4 × 12-foot wire mesh. Screen sizes moved downward to develop optimum production by routing material to jaw and roll crushers.

The bottom screen deck in this preliminary sizing unit was 4 × 8 feet. All material meeting specifications passed through the three decks and was carried by several conveyors to a stacker which feeds the surge bin.

Oversize rock, rejected by the top scalping deck, passed into a 20 × 36

(*Continued on next page*)

For more facts, circle No. 377→



This Universal TwinDual rock plant turns out 600 tons per hour of 2-inch-minus base-course material and 400 tons per hour of 1-inch-minus top-course rock. The job requires 175,000 tons of subbase.

Versatile D Tournapulls save time for Illinois contractor

Handle production dirt and finish work

On U.S. 66 near Pontiac, Illinois, 650,000 cu. yds. of clay and topsoil are being moved to widen 25 miles of this highway.

On the job, the Standard Paving Co., of Chicago, encountered production difficulties when 2 of their 4 scrapers broke down. To keep production dirtmoving on schedule, one 28 mph D Tournapull was moved from shouldering work to production hauling. A second "D" remained on fine grade and other one-man-crew clean-up assignments.

8400′ cycle every 8 minutes

Working with a pusher from a borrow pit, the 138 hp "D" loaded 5½ pay yards of tough-to-handle clay in about 30 seconds. "D's" ability to partially self-load saved time and work for pusher on loading cycle. Haul, spread, and return took about 7 minutes. 8400′ cycle was completed in 7½ minutes. Cycle time for other scraper units averaged about 9.5 minutes. Despite the fact that "D" was working with bigger rubber-tired dirtmovers, it matched, and often bettered the speeds of bigger units on haul and return trips.

Second "D" on fine grading

The second D Tournapull was being used with a motor-grader to fine-grade before paving courses were put down. It self-loaded excessive dirt windrowed by grader. Unit averaged 1¾ minutes on 350′ cycle. Operator Henry Carbine said, "The 'D' is the best machine for fine-grading."

Tops for any job

You'll find, as did this contractor, that the versatile D Tournapull is a mighty handy tool to have in your fleet. It is ideal for hauling, grading, building shoulders, shaping backslopes, digging drainage ditches, spreading gravel, connecting access roads, backfilling around culverts, leveling land, stripping overburden, and doing dozens of other scattered small clean-up jobs that turn up. It is a machine that can work and earn every day of the year.

Speeds job-to-job

D Tournapull runs at 28 mph from job-to-job. Big 18:00 x 25 low-pressure tires allow unit to travel anywhere . . . over pavement, blacktop, curbs, railroad tracks and bridges. Extreme mobility of "D" saves time by allowing it to take the shortest route to job. To find out what the 7-yd. D Tournapull can do for you on your next dirtmoving job, see your LeTourneau-Westinghouse Distributor. He'll be glad to show you owner-verified production figures

"D" self-loads, hauls and spreads windrowed material on 350′ cycle in about 1¾ minutes

Tournapull—Trademark Reg. U.S. Pat. Off. DP-875-H-I

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

An Adnun Blaw-Knox Paver is used for four base-course lifts and the 1-inch surface course. Longitudinal joints are staggered to minimize the possibility of failure in the road.

(Continued from preceding page)

jaw crusher capable of breaking down large pit-run boulders. Throughs from this crusher passed to a set of Universal 30-inch TwinDual roll crushers, which broke the rock down in two successive steps. The entire crusher fraction then moved at this point to a top return belt, where the sizes were graded through a triple-deck set of 4 × 12-foot screens. Oversize material on these screens passed in closed circuit through the roll crushers until all rock fragments met required specifications.

The main plant unit, consisting of jaw-and-roll-crusher assemblies, was direct-driven by a Murphy 165-hp diesel engine. Three Schonrock cable-dump trailers, four International K8's, and four Ford F8's hauled material from the plant.

Plans called for from 6 to 9 inches of 2-inch-minus base material, laid in 3-inch lifts. A single 3-inch lift of 1-inch-minus surface-course material topped this. Summer rains had helped rather than hindered the laydown of subbase rock, and whatever extra water was necessary was added before the material was bladed and mixed. Three Cat No. 12 motor graders and one Galion machine mixed and bladed the material.

After being properly blended, the material was cut out from windrows, laid in the required lifts, and rolled by two 10-ton, three-wheel steel rollers. One small pneumatic compactor was assigned to the job for surface compaction. The surface of the top course of subbase was then primed by an application of MC-1 asphalt.

Twin hot-plant setup

Keeping pace with the production rates set on grading and subbase work, Mendenhall crews worked six days a week at a dual hot-plant installation capable of producing about 1,200 tons during each 10-hour shift.

The setup consisted of two 2,000-pound asphalt batch plants, one a Madsen and the other a Standard. By changing the dryer burners in the Madsen plant to a three-bank set of Hopkins burners, with integral electric-driven blowers which supply air to the burner tips, Mendenhall was able to reduce the steam requirements of the two plants. Steam required on the Madsen plant for line jacketing, hot-pot jacketing, and the heating of asphalt was supplied by a Cleaver-Brooks steam generator, which also supplied steam for line and hot-pot jacketing, pugmill ram operation, asphalt heating, and for atomizing dryer fuel on the Standard plant. A No. 5 grade of fuel oil, preheated before entering the burners, was used on both plants.

A Caterpillar D13000 diesel-electric generating set supplied power to motors on both plants. The dryer on the Madsen plant was belt-driven by a Caterpillar D4400 diesel, and the pugmill also had Caterpillar diesel power, belt applied. The Standard plant was belt-driven by a D13000 engine.

Asphalt storage, common to both plants, provided about a 35,000-gallon capacity for the 120 to 150-penetration asphaltic cement, which was brought 300 miles to the site from the Phillips Petroleum Co. refinery in Salt Lake City. A central Viking asphalt pump supplied circulating asphalt at application temperature to both hot pots.

Mendenhall's rock-crushing equipment produced the entire tonnage of mineral aggregate for the 66,000-ton paving item. The aggregate, containing a sizable portion of crushed material, was produced at each hot-plant location by a Cedarapids Master tandem crushing-screening plant. The material, closely sized to meet specifications, was fed to the cold elevator on each plant by a D8 dozer, shoving into feeder traps at each plant. Final sizing, of course, was done on the plant screens which reject material

THE BUFFALO-SPRINGFIELD K-45 KOMPACTOR

How to select compaction equipment

The logical question to ask yourself when you are ready to buy new compaction equipment is: "Exactly what do I need the equipment for and how will I use it?"

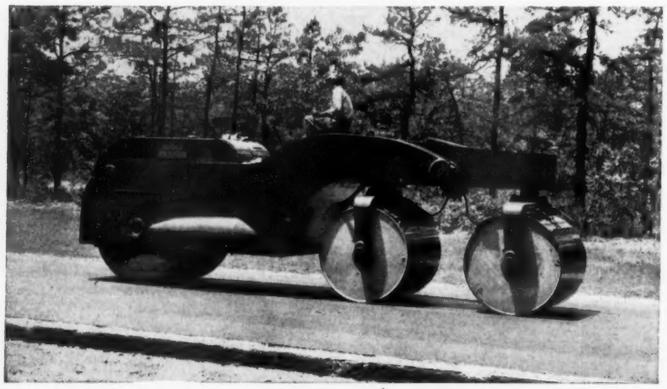
BASE FILL COMPACTION—This type of compaction demands equipment that will handle a wide variety of materials, give you the highest degree of compaction with the fewest passes. Buffalo-Springfield's revolutionary K-45 Kompactor is proving a real money-making answer for this type of work. It is self-propelled, relies on the "Interrupted Pressure Principle." All compaction effort is directed downward. Contractors testify they are meeting density requirements in one-fourth the time normally required with other compaction equipment.

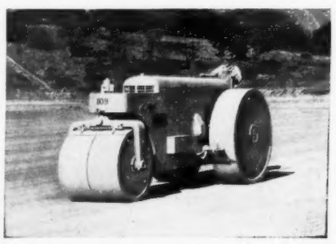
FINE GRADE FINISHING—Buffalo-Springfield offers six 3-wheel rollers, ranging in capacity from 5 to 15 tons, to handle the large variety of materials found in fills, subgrades and unfinished bituminous pavements. The variable-weight 3-wheel roller is ruggedly built for years and years of hard, maintenance-free work.

Buffalo-Springfield's thoroughly-proved 3-axle tandem "walking beam" roller provides up to 60% greater tonnage compacted per day in superhighway construction, airport and military establishment jobs where specifications are extra strict.

ASPHALT FINISHING—Two-axle Tandem Rollers are designed especially for all surface finishing jobs. Ranging from 5 to 16 tons, Buffalo-Springfield Tandems are used for

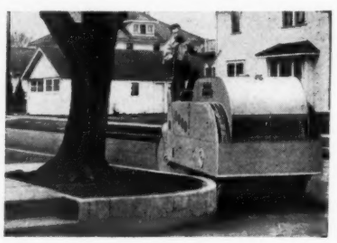
THE BUFFALO-SPRINGFIELD KX-3 AXLE TANDEM





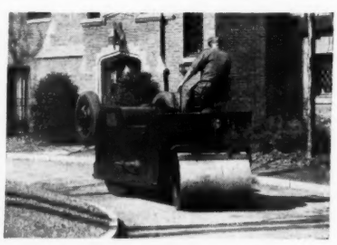
3-WHEEL ROLLERS

heavy-duty highway and public works projects, and all types of finishing, maintenance and repair work. A wide selection of models for the biggest to the smallest jobs are designed for long-life and profitable operation.



TWO AXLE TANDEMS

SHORT ROLLING JOBS—Buffalo-Springfield's 3-5 ton portable roller is widely used for rolling driveways, sidewalks, parking and playground areas, and for patching and light fin-



3-5 TON PORTABLE TANDEM

ishing jobs. It is highly maneuverable and portable from job-to-job. Write today for full information on the type of equipment you need—or see your nearest distributor for an on-the-job demonstration.

The Standard *of Comparison*

BUFFALO SPRINGFIELD

SPRINGFIELD, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 378

left over from any fraction.

Use one laydown machine

Mendenhall used one laydown machine, an Adnun Blaw-Knox Paver, for all paving. Base course hot-mix, mixed with 1-inch maximum size aggregate, was laid in four 2-inch compacted courses in 11.5, 10.0, 11.0, and 9.0-foot widths. The surface course, mixed with ½-inch-minus aggregate, was laid to a compacted thickness of 1 inch in four 10-foot lanes. Lanes of the bottom course were of differing widths staggering longitudinal joints to minimize chances of failure in the road.

From 6 to 15 rented batch trucks hauled the hot-mix to the Adnun machine. As soon as the pavement has been laid long enough, it was rolled by a Buffalo-Springfield 3-axle tandem roller, which also did final rolling. A flush coat of asphalt, applied after the paving had been finished, completed the project. At the same time, motor graders gave backslopes and side borrow a final dressing to leave the sides of the new highway in good condition.

It has become a practice throughout the Rocky Mountain States to give shoulder sections of wide asphalt highways such as this a contrasting chip-color treatment as a part of seal coating, so that automobiles may park safely at the edge of the highway. This work may be done later by maintenance forces.

Construction of the 16-mile section was done under the general supervision of the Utah State Road Commission, of which E. G. Johnson is chief engineer. R. A. Gillis, with headquarters at Cedar City, was district engineer. Sheridan Fiack, of the Salt Lake City office, was construction engineer in charge of the job, and Ben Lee was resident engineer. S. I. Morrell superintended the job for Germer, Abbott & Waldron. THE END

Avoid wet-weather damage to surface dressings

Three simple processes of using adhesion agents to protect surface dressings on roads from damage by rain are described in Road Note 14, (second edition) "Prevention of Wet-Weather Damage to Surface Dressings."

Two of the processes involve the use of a solution of an adhesion agent in creosote. This solution is used either to precoat the chippings or to pretreat the binder before chips are applied.

The third process uses an adhesion agent incorporated into the binder before it is spread on the road. Though simpler and requiring no extra equipment, this is generally more expensive, since larger quantities of the agent are required. Once in the binder, the agent must be used, whether conditions require it or not.

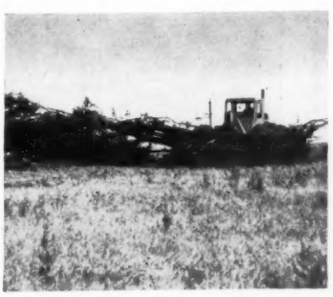
The note, describing each method in detail, is published in England by H. M. Stationary Office for the Department of Scientific Industrial Research, Charles House, 5–11 Regent St., London, S. W. 1. It may be obtained from the department for 18 cents, including postage.

For more facts, circle No. 379→

Both the initial knock-down roll and final compaction are done by this Buffalo-Springfield three-wheel tandem roller. A flush coat of asphalt will complete the project.

Pictures of a tractor in a hurry!

On this road-widening job near Denison, Iowa, a grove of 60 ft. trees ranging from 10 to 15 inches in diameter had to be removed. Tournatractor did the entire job alone. First it dozed dirt from around the base of each tree to cut surface roots. Then, with dozer blade raised near maximum 54 inches, Tournatractor pushed trees over. Complete uprooting task averaged 3 to 4 minutes per tree. Said the tractor operator, Elmer Schwarz, "This rig did a wonderful job in tree removing!" Its instant-shift transmission kept maximum "push" on the tree at all times . . . quick-shift into high-speed reverse let unit move away quickly from falling trees.



Speeds clean-up, push-loading, & pulling

After uprooting trees, Tournatractor pushed them 300 ft. for disposal in a field. Push took 2½ minutes; return took about 40 seconds. "Tournatractor did one job fast and was ready immediately for another," comments operator Schwarz. Other assignments included push-loading scrapers, pulling rollers, and handling other important tractor work.

On 40 ft. push, dozes 115 yds. hourly

When trees were removed, Tournatractor dozed in material from 50 ft. on both sides of the road to raise grade 2 ft. and to cut down banks prior to major scraper dirtmoving. Loads averaged 2½ to 3 pay yds. per push. On 80 ft. cycles, push, spread, and return took 1.3 minutes. Big low-pressure tires helped compact material as it was spread on the run.

Travels job-to-job at 19 mph

Crawford County Hwy. Dept. owners, report Tournatractor goes virtually anywhere at speeds to 19 mph. Emergency jobs 5 miles away can be reached in about 20 minutes. As Job Supt. Leonard Hassett summarizes, "One of Tournatractor's advantages is that it can move quickly and efficiently." Let us demonstrate this speed advantage on *your* job. Write for details.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-823-P-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

manufacturer memos

Caterpillar appoints aide to firm's vice president

Frank A. Grooss, a specialist in the development of wheel tractors, motor graders, and scrapers, has been appointed assistant to vice president G. E. Burks, director of the engineering and research departments. Mr. Grooss was formerly chief engineer at the company's Decatur, Ill., plant.

With the Caterpillar engineering department since 1948, Mr. Grooss has been succeeded at Decatur by A. W. Sieving, previously general supervisor of that plant's engineering.

Twin Disc Clutch fills industry manager posts

As a result of the reorganization of the field sales force, four men have been appointed to the newly created industry manager posts with the Twin Disc Clutch Co., Racine, Wis.

G. W. Upp, the industry manager of crane and shovel accounts for Twin Disc Clutch Co.

G. W. Upp, former Cleveland district manager, has been named manager of crane and shovel accounts. He has been with the company since 1946.

Other managers are: R. C. McRoberts, engine accounts; P. G. Tyrrell, rubber-tire vehicle accounts; and George Bastian, metalworking accounts.

The men will work directly from the firm's offices in Racine, Wis., and Rockford, Ill.

Mr. John B. Laramy, the new assistant general sales manager of Worthington Corp.

Worthington appoints

John B. Laramy has been appointed assistant general sales manager of Worthington Corp., Harrison, N. J. The 26-year veteran of the firm is the former assistant district office manager of Chicago, and before his recent promotion, was manager of the marketing research department. Mr. Laramy will be succeeded in his former post by Alvin F. Welsh.

Marvel Engineering moves to new plant headquarters

Marvel Engineering Co., designers and manufacturers of Marvel synclinal filters, has moved to its recently completed plant at 7227 N. Hanlin Ave., Chicago 45, Ill. The modern one-story building allows for further expansion if necessary.

Enlarged designing and engineering departments facilitate the company's research for the improvement of filtration of hydraulic oils and other liquids in low-pressure circulating systems.

Napco fills sales post

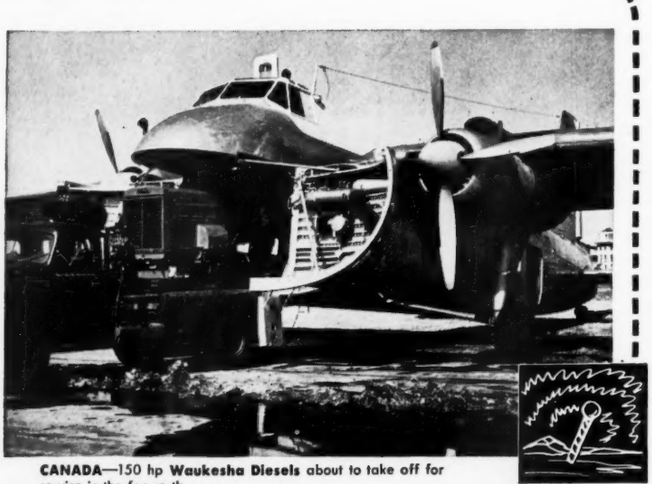
Roy E. Mullin has been promoted to the newly created post of general sales manager for Napco Industries, Inc., Minneapolis, Minn. In his new position, Mullin will supervise the sales of Napco construction machinery, Federal motor trucks, and highway safety appliances.

Dave Hansen and Orv Reynolds have been appointed sales manager and assistant sales manager of the firm's construction equipment division. They will work under Mr. Mullin.

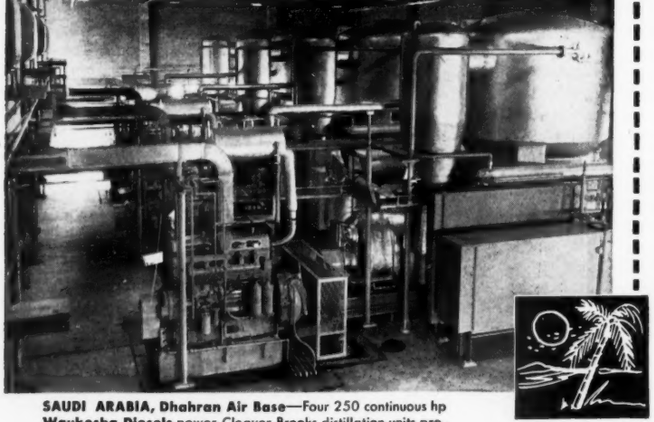
American Hoist appoints distributor sales manager

The American Hoist & Derrick Co., St. Paul, Minn., has appointed G. O.

from the Canadian Arctic to Saudi Arabia



CANADA—150 hp **Waukesha Diesels** about to take off for service in the far north.



SAUDI ARABIA, Dhahran Air Base—Four 250 continuous hp **Waukesha Diesels** power Cleaver-Brooks distillation units producing 200,000 gal. of potable water daily.

50th ANNIVERSARY Waukesha 1906-1956

Power packed, fast, smooth—with built-in stamina for service in any country or climate—Normal or Turbo-diesels, Gas, or Gasoline Engines—up to 1135 hp. Waukesha Motor Company, Waukesha, Wis., New York, Tulsa, Los Angeles. Send for Bulletin 1079.

WAUKESHA Diesels

290

For more facts, use Reader-Reply Card opposite page 18 and circle No. 380

SHAV-O-DISC
FOR
FAST — EFFICIENT
DISCING AND PULVERIZING

Shav-O-Disc consists of two apposed sections of gang type discs of chrome molybdenum steel specially heat treated to withstand 6½ tons of pressure and retain cutting ability over a long period of time. Discs are mounted in heavy, fabricated steel frame and attached to motor grader with adjusting arms, attached to scarifying controls, for controlling leveling and depth cut. The inverted "V" wedge, two gang apposed design (patent applied for) eliminates all side thrust.

SHAV-O-DISC . . .

1. Cuts, shapes, pulverizes in one operation
2. Blade free at all times
3. One man operation
4. Full 56" cut instantly adjustable
5. Inverted V eliminates side thrust
6. Operates from scarifier controls
7. Successfully used for breaking ice
8. For any motor patrol.

Write for illustrated literature

SHAV-O-DISC MFG.
149 Union Ave., Bakersfield, Calif.

For more facts, circle No. 381

Advertisement

99 ft. Continuous Pour Using Richmond Tyscrus Believed Record

M-C & S designs forms for pour without interruption

What is thought to be the highest continuous pour in the area was made by Merritt-Chapman & Scott on its pier construction for the Newark Bay Bridge. For each of the 41 piers on the Newark side of the bay, and the 16 piers on the Bayonne side, forms were designed for a 10' liquid head and were set to the full height of the pour. Richmond Tyscrus were used throughout; 123 1" 4-strut Richmond Tyscrus holding the highest placement – 99' 9⅜". Concrete was poured to the maximum design strength of tie rods and forms, and every column went up without incident.

For speeding all types of concrete form work, the extra safety margin of Richmond Tyscrus counts heavily. The actual load strength of Richmond Tys far exceeds their published load. For instance, severe performance tests conducted by Brooklyn Polytechnic Institute show that 1" 4-strut Richmond Tyscrus (published safe load strength 24,000 lbs.)—identical with those used on the Newark Bay Bridge—actually test out at 38,000 lbs.

Hangers, Screed Chairs, Lagstuds and all Richmond equipment are made with the same professional attention to the contractor's needs as are Richmond Tyscrus. Write for the 1955 Richmond Catalogue which details Richmond products and their many uses. It can save *you* time and money on your next job. Address:—RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y., or 315 South 4th Street, St. Joseph, Mo.

MADE ON RICHMOND AND SO SURE IT'S RICHMOND! Richmond SCREW ANCHOR CO., INC.

For more facts, circle No. 382

G. O. Britton, the new distributor sales manager of American Hoist & Derrick Co.

Britton to the post of distributor sales manager. He will be responsible for the sales of the company's line of crawler and truck-mounted cranes and excavators as well as for the sales of hoists and derricks.

Mr. Britton formerly served in executive sales capacities with the Athey Products Co., and the Schield Bantam Co.

Cummins names manager for Canadian district

Representing the Cummins Engine Co., Inc., Columbus, Ind., in eastern Canada is Peter Ster, Jr., regional manager. He will serve as direct factory liasion man in the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Newfoundland, and Labrador.

A member of the Cummins organization since 1951, Mr. Ster will maintain headquarters in Toronto, Ontario.

Robert E. Hunter, the new general sales manager of Detroit Diesel Engine Division, General Motors Corp.

Detroit Diesel names general sales manager

Robert E. Hunter has been appointed general sales manager of the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich. With the company since 1937, Mr. Hunter has served as assistant director of industrial relations for the Electro-Motive division; district sales manager in Chicago; and until his appointment, he directed sales for General Motors Diesel, Ltd. of Canada.

Thor Power Tool acquires Cincinnati Rubber Co.

The inventory, machinery, buildings, name, and good will of the Cincinnati Rubber Mfg. Co., Cincinnati, Ohio have been acquired by the Thor Power Tool Co., Aurora, Ill., at a purchase price of $1,600,000. The Cincinnati firm manufactures transmission and conveyor belting, hose, rubber roll covers, and related products that are considered companion commodities of power tools.

J. F. Joseph, president of the Cincinnati company has become chairman of the board, and L. P. Darnell, the former vice president and general manager, has become president. No other changes have been made in the management or operations of the company.

Lincoln names managers

Merrill F. Yale has been assigned to the post of district manager of the new Denver, Colo., branch office and warehouse of the Lincoln Electric Co., Cleveland, Ohio. Located at 1224 Walnut St., the new branch will be staffed by trained welding engineering consultants under the supervision of Yale and his assistant, Scotty Lambrecht.

The new district manager for Chicago is Ray Zeh, former Syracuse manager. Mr. Zeh will be replaced at his former post by Joseph Chemerys.

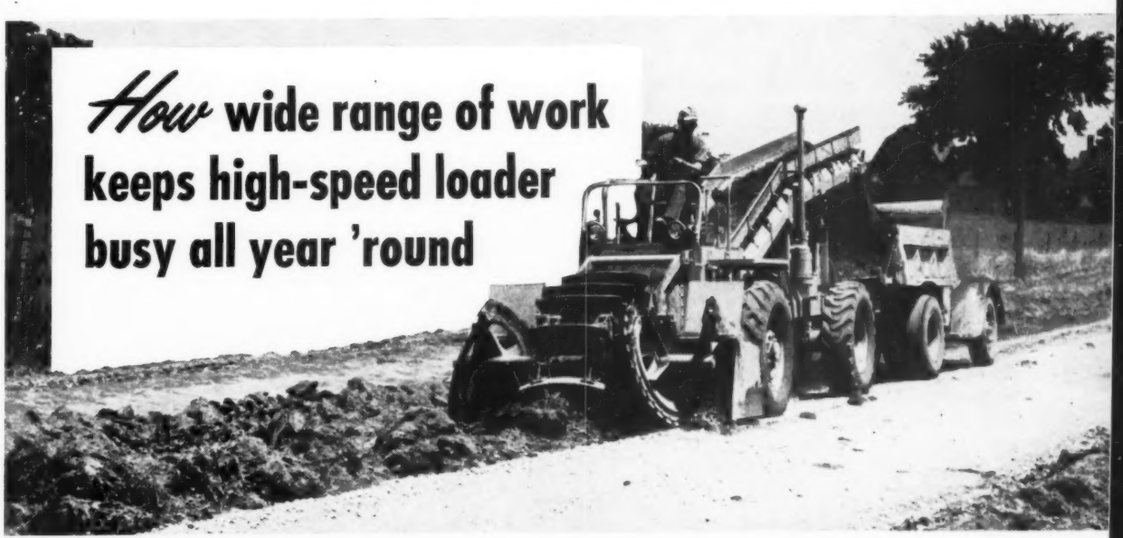
Harold C. Clark, the new sales manager of the Findlay Division of Gar Wood Industries Inc.

Gar Wood appoints

Harold C. Clark has been appointed sales manager of the Findlay Division of Gar Wood Industries Inc., Wayne, Mich. In his new position, Mr. Clark will direct sales activities for the Buckeye line of ditchers and road-building machinery, and Gar Wood power excavators and cranes.

Le Roi opens branch to serve Southwest

A new sales branch to serve the southwestern section of the country has been opened by the Le Roi Division of Westinghouse Air Brake Co., Milwaukee, Wis., manufacturer of internal combustion engines, heavy-duty air compressor and air tools. The new address is 5000 45th West Ave., Tulsa, Okla.



How wide range of work keeps high-speed loader busy all year 'round

On this road-widening job, surplus materials are loaded from windrow into truck in a matter of seconds. No traffic interference.

Here is a heavy-duty, self-propelled, belt-type loader having a wide range of applications for highway departments. It loads practically any type of loose material out of windrows or stockpiles. In addition to high loading capacity, it gets around fast from job-to-job.

Use Adams TraveLoader for picking up surplus material on road and street construction or reconstruction. Use it for loading materials out of borrow pits and stockpiles. TraveLoader works fast in dirt, sod, sand, gravel, crushed stone, slag, cinders, snow. It loads topsoil for landscaping with no prior preparation.

How it works

TraveLoader loads in any one of a wide range of 5 working speeds from 0.29 to 1.9; has 5 travel speeds from 3.90 to 26.7. The floating, revolving, screw-type feeder automatically adapts its speed to the load ahead and places a continuous flow of material on the conveyor-belt. Trucks can be loaded with loose materials at up to 10 yards per minute. Travel speed range makes it easy to keep TraveLoader working to capacity. Trucks load behind loader, do not interfere with passing traffic. Moves job-to-job over highways and city streets at speeds to 26.7 mph.

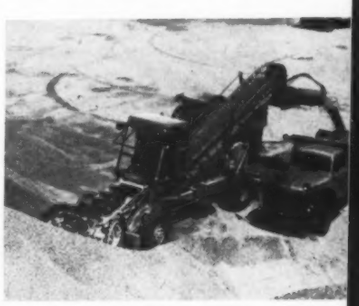
Heavy, durable construction

All-welded, box-construction, one-piece frame extends full length of machine. Heavy-duty front and rear axles, sturdy feeder mechanism, rigid conveyor with sealed-for-life roller bearings, give TraveLoader the necessary strength to handle heavy loads at fast speeds with minimum downtime and maintenance. *Available with gasoline or diesel engines.*

Easy to operate

You will like TraveLoader's centrally-located control station . . . up out of the dust, permitting clear vision in all directions. Easy, fast, hydraulic controls, give quick adaptabiiity to any working condition.

Get all the facts on the Adams TraveLoader from your LeTourneau-Westinghouse Distributor.



Side-shiftable cross conveyor (optional) loads trucks on either side of machine, assures proper balancing of load. A great time-saver in materials yards. Conveyor position power-controlled from operator's cab.

Cities have many uses for TraveLoader. For instance, ice and snow on city streets can be loaded at the rate of 12 to 20 yards per minute. TraveLoader finds work the year 'round.

Here a contractor cuts and loads gravel out of a natural bank. Many contractors and highway departments use TraveLoader for loading stockpiled materials of all kinds.

AL-5-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Equipment was not seriously affected by conditions at the marshy site because of routine servicing and maintenance. This Tournapull is stopped for a fast grease job by a service truck carrying Alemite equipment.

Scrapers range marshy a se

Large borrow pit yields 200,000 cubic yards of earth; two passes by rigs make ground water visible

Construction of a 200,000-cubic-yard experimental fill on the shores of Great Salt Lake northwest of Ogden, Utah, has stirred up a great deal of interest locally, for if tests prove favorable, a 25-foot-deep fresh-water reservoir will be built near Willard as part of the Weber irrigation project.

Outside the area, the Willard Test Dike has aroused interest, too, but for different reasons. First, the excellent instrumentation control on the job will give engineers a better idea of the behavior of marshy, unstable ground under various loadings. Second, construction of the fill showed how earthmoving equipment fared as it worked over soil having a water table sometimes within 12 inches of the ground surface. Although some of the surrounding area is under cultivation, much of the site is a bottomless marshland. Geologists estimate the depth of mucky overburden at 7,000 feet, and probings up to 50 feet deep by U. S. Bureau of Reclamation technicians have disclosed only progressively softer material.

Since there was a strong possibility that a dam of conventional height and design might fail due to settlement of the unstable material, the USBR constructed the Willard Test Dike in one of the softer areas to

A technician checks the water-table level near the toe of the embankment as part of the USBR's daily test of instrumentation. The 570 × 800-foot dike, which will contain 200,000 yards of material, is in the background.

With Barnes it's
FORWARD ACTION
all the way in '56

FORWARD ACTION in *plant facilities* aimed at having the most modern and efficient pump plant in America.

FORWARD ACTION in developing a completely *new multi-line "T" formation production and assembly unit* to (1) step-up production capacity and (2) provide a heavy stock of completed pumps for immediate delivery to customers.

FORWARD ACTION in *product excellence* and *quality control* assuring Barnes customers that every pump produced will meet their highest standard of expectancy.

FORWARD ACTION in *Order Service* designed to give "fast action" service on all customer orders and problems.

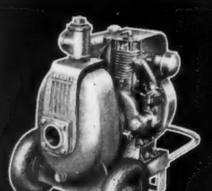
FORWARD ACTION in *Service* providing a *parts delivery and service* second to none.

Barnes has cleared the decks for *Forward Action* in '56.

Forward Action plant relayout developed through the coordinated efforts of Wörden and Risberg—top management consultant firm, and Barnes Management.

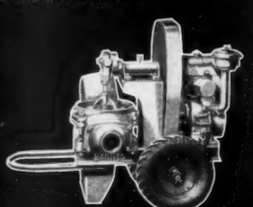
Barnes Builds Better
—you can do likewise in '56

BARNES
Manufacturing Co.
Mansfield, Ohio
Oakland 21, Calif.



A PUMP FOR EVERY PURPOSE — A complete line of Self-Priming Centrifugal pumps with capacities up to 90,000 gph. For peak portability Barnes offers their "Light Weight" line of Self-Priming Centrifugals with cast aluminum bodies and engines for minimum weight. Capacities up to 18,000 gph. Available with electric or universal drive.

CHOICE OF DRIVES—Barnes Self-Priming Centrifugals are available for a wide choice of drives. Close-coupled for gasoline engines; flexible coupled for electric or diesel; or belt drive for adaption to any power source.



DIAPHRAGM PUMPS — Portable, lightweight, compact general dewatering pumps for handling more water with higher . . . percent of solids. 3- and 4-inch models. Capacities up to 6,000 gph.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 384

secure fill for test dike

Stiff clay rises high in a Cat DW21 scraper as an Allis-Chalmers HD-19 helps push-load the rig. As it moves across the borrow area, the scraper keeps its bowl floating along the surface to avoid being stuck in the soft ground.

check loading characteristics of the marshland. This is being done by duplicating actual construction conditions and providing an intricate test system to measure pressures and settlement in the embankment and foundation.

Though it will be some time before definite conclusions can be reached, observations to date have been encouraging. If the dike proves practicable, flood waters from the Weber River, now going to waste in Great Salt Lake, can be diverted to the proposed reservoir, then pumped back into the Weber River irrigation supply as needed.

Surveyors disclose problem

Young & Smith Construction Co., Salt Lake City, had a good idea of what the area was like when it moved in last summer to construct the dike under a 90-day USBR contract. Several years ago, USBR surveyors had studied the site, traveling over many square miles to find exactly what lay beneath the flat monotonous tract and to pick a site for the test embankment. The thousands of borings and other samples taken showed how spongy, waterlogged, and soft the area was.

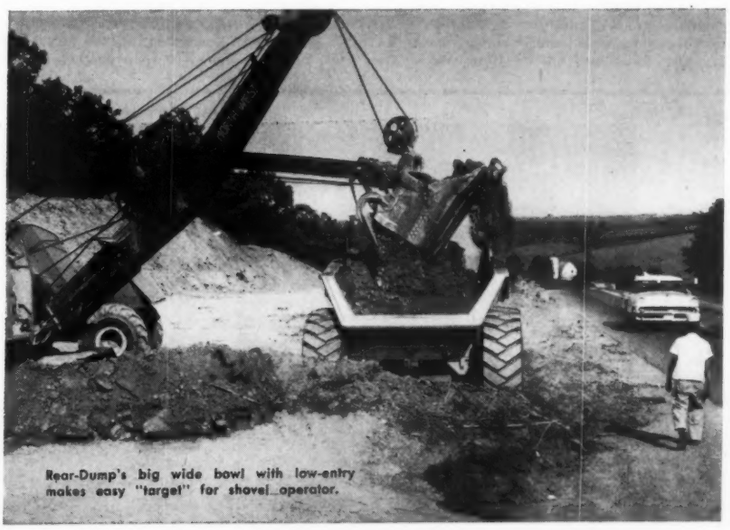
These surveyors used two Dodge Power Wagons, each equipped with a winch and cable, to get around on the soft marshland. If there was any question as to the solidness of the soil, the surveyors kept one machine on solid footing and hooked a winch line to the other machine so that it could be pulled out of boggy places. Preliminary probings showed the marsh to be a bottomless expanse of silt, slick clay, sand, and muck, with a water table sometimes near ground level. Seldom was it more than three feet below the ground surface.

Preliminary work

Before dirt-moving got under way for the 570 × 800-foot dike, containing 200,000 yards of material, test instrumentation was installed. This included several rows of piezometers, settlement plates, and precisely surveyed line and grade points around the toe of the fill. As the load increased, these points were rechecked from time to time by surveying instruments, which showed whether or not the marshy toes were holding. Failure of the toe by shoving will be immediately apparent; other loading and settlement characteristics will show up through piezometer and settlement plate readings.

(*Continued on next page*)

For more facts, circle No. 385→



Rear-Dump's big wide bowl with low-entry makes easy "target" for shovel operator.

Speed 350,000-yd. job

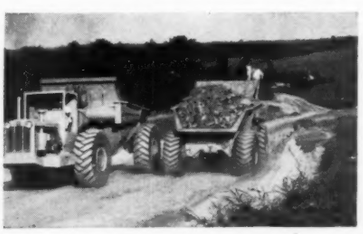
on U. S. Route 460 with 3 Tournapull Rear-Dumps

To widen U. S. Route 460 in Campbell County, Va., from 2 lanes to a 4-lane divided highway, Talbott-Marks Company, Inc., Clarksville, Va., has 350,000 yds. of shale and rock to haul from cuts to fills. Equipment brought in by contractor to handle job included 3 C Tournapull Rear-Dumps and one 1½-yard shovel.

Production figures on a typical 5000′ cycle showed each C Rear-Dump averaged 10 trips per hour. Loads per machine averaged 10 yds. Each rig hauled 100 yards per hour to total 300 yards for the three. Haul route was in fair condition with 7% return grades. Speed and maneuverability of Le-Tourneau-Westinghouse units kept them well ahead of loading shovel. 90° turn-ability of Rear-Dump lets operator swing hauler quickly into position at shovel for elimination of spotting delays.

Owner A. W. Talbott says units are "Very satisfactory." Two of his Rear-Dumps were driven 354 miles to this job from Hereford, Md., in 18 hours, where they had worked on a 300,000-yd. rock section of the Baltimore-Harrisburg expressway.

If you have a hauling problem, it will pay you to investigate the Le-Tourneau-Westinghouse Rear-Dump. Write or call us for further production studies and specifications. There's no obligation.



Passing on incline, Rear-Dumps speed along haul route on big, single, low-pressure tires.

There's a size to fit your needs

Model	Capacity	HP	Overall Length
D	11 tons	138	25′2″
C	22 tons	208	30′
B	35 tons	293	37′3″

Model	Width req'd, non-stop 180° turn	
	Travel position	Dump position
D	24′8″	19′2″
C	28′8″	20′8″
B	35′	27′

Check these advantages as applied to your job

Hauls anywhere — Big single low-pressure tires let Rear-Dumps safely travel narrow haul roads, paved highways, city streets . . . haul cross-country over roughest terrain, through muck and soft fills.

Turns in less space — This Rear-Dump makes 180° non-stop U-turn by power steer in less than its own length. It eliminates time normally wasted see-sawing to back into or turn in narrow quarters.

Reduces maintenance — Because these Rear-Dumps have no jack lines, no long drive-shaft, no frame, subframe, springs or tie rods, most common troubles of conventional rear-dump haulers are eliminated.

Dumps fast, clean — Flick of switch activates hoist motor. Body lifts quickly to any desired angle for spreading on run. At full dump position, bowl-lip is behind rear wheels so dump can be made clean over bank. Streamlined body sheds material readily.

Cuts weather delays — Power-transfer differential automatically applies power to drive wheel on firmest footing . . . pulls unit through mud, sand, soft materials which stop ordinary haulers. It's a Tournapull exclusive.

Resists body shock, damage — Three-layer, all-steel, grid-type bowl with tool-steel floor resists loading shocks. Big, wide bowl opening (8′9″ x 10′10″) is easy target for any loading unit.

Improves safety — Multi-disc air brakes have more braking surface on one wheel than most haulers have on all 4. Low center of gravity, good visibility, front-wheel drive, easy control all contribute to maximum safety.

Delivers full power — Torque converter (optional in C size) automatically balances load and torque so you get full horsepower always. Lugging is reduced; shocks in transmission and final drive virtually eliminated.

Reduces fatigue — Big low-pressure tires, 24.00 x 25, and air-foam cushion seat smooth out ride for operator. Electric push-buttons control power steer and 2-way power dump. Eliminated is loss of momentum and all manual work of fighting balky levers.

Insures future earnings — Behind Tournapull prime-mover, you can interchange rear-dump with scraper, bottom-dump, crane, flatbed. These trailing units lower your investment, let you handle any future job efficiently, help you keep your Tournapull profitably busy the year-around.

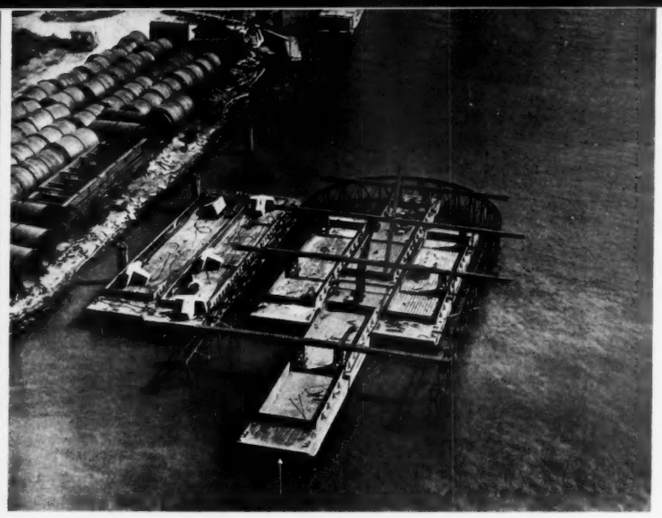
Tournapull—Trademark Reg. U.S. Pat. Off. R-929-H-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Construction camera



GETTING READY FOR WORK on the $25 million Mississippi River Bridge at New Orleans, La., Dravo Corp., Pittsburgh, Pa., prepared a U-shaped steel structure to moor a floating steel caisson that now forms the base for one of the main piers. The stall was secured in position, 550 feet from the bank, by 39 steel pipe plies driven into the river bottom and filled with sand. The 500 x 300-foot mattress, above, woven of willow trees, was sunk about 75 feet to the riverbed so that the 500-ton caisson could knife through it. This prevented the swift river current from washing silt and mud away from the pier.

(Continued from preceding page)

USBR specifications permitted the installation of the first lift of soil, 3 feet deep, for two reasons. It afforded the proper measure of protection to instruments buried in the ground beneath the embankment site and, secondly, it permitted equipment to get its job done as rapidly as possible. Since the principal purpose of the embankment is to determine loading characteristics, no special compaction requirements, other than that delivered by the passage of hauling units, was required by specifications.

Young & Smith, working under the supervision of general superintendent B. H. Stringham, used an equipment fleet consisting of a Caterpillar D8 tractor with a No. 80 scraper for extremely short-haul work and toe dressing, two Caterpillar DW21's, two Model C Tournapulls, and two LeTourneau-Westinghouse Model C Tournamatic scrapers.

Since the adequate performance of this equipment depended on good use of pusher tractors, especially in marshland like this, three push tractors were assigned to the job—an Allis-Chalmers HD-20, an Allis-Chalmers HD-19, and an International TD-24.

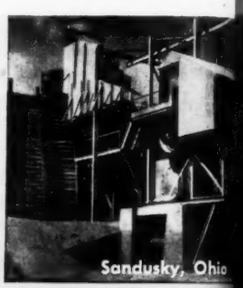
A Caterpillar No. 12 motor grader worked on dressing haul roads and leveling lifts in the fill since, after the first 3-foot lift, 12-inch lift limits were specified. The only other equipment on the job consisted of a Ford-mounted 2,000-gallon water truck for sprinkling the surface of haul roads, two Rex centrifugal water pumps for supplying water to this unit, and an Alemite-equipped mobile service truck for field service and maintenance.

Since the footing for equipment was so treacherous, Stringham's first job was to build about three miles of haul roads with dozers. These rigs shoved the drier surface material above marshland level to create a dike-type road. The borrow pit was then criss-crossed by stub roads leading from the main system of haul trails. Since the stub roads were located approximately 150 to 200 feet apart, a haul unit could go off one road and be fully loaded by the time it reached the next stub.

As soon as work started, operators

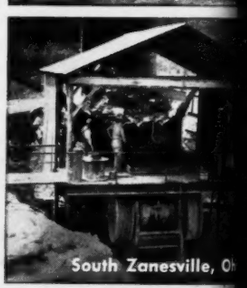
These 42x48 GRIZZLY-KING crushers, the biggest overhead eccentric jaw crushers ever built, are already established as performance kings in output and low-cost operation.

Davidson, N. C.


Sandusky, Ohio

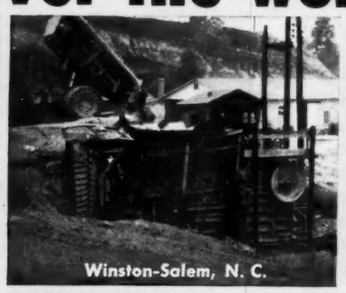
Chattanooga, Tenn.

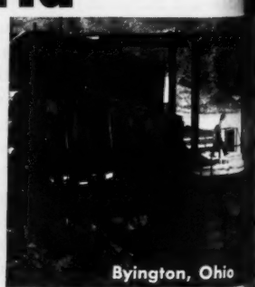
Elizabethtown, Ky.


South Zanesville, O

breaking rocks and records ...all over the world

These older installations of GRIZZLY-KING giants have been establishing themselves right along as production leaders in some of the biggest quarries.


Winston-Salem, N. C.


Byington, Ohio

Mitchell, Ohio

New Castle, Pa.

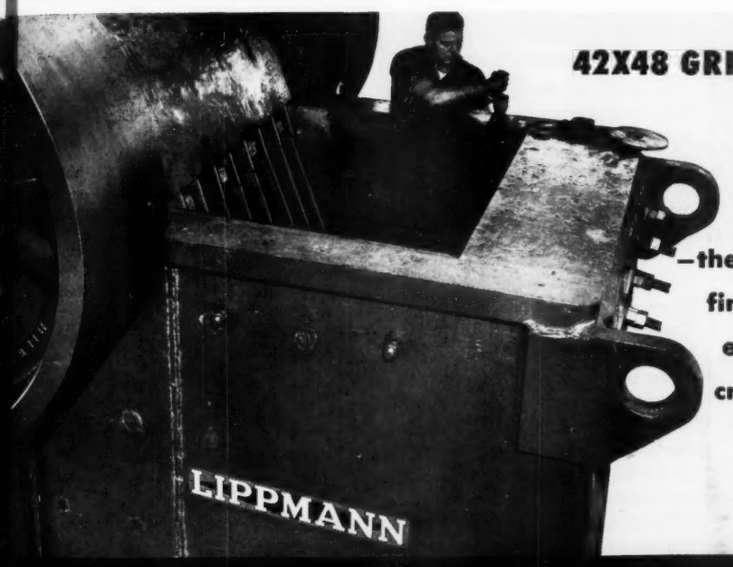
Bloomington, Ind.

LEW LIPPMANN

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLA

CONCRETE IS BUCKETED into forms for the new bridge spanning Silver Creek on the New York Thruway. Column forms for this span, requiring 420 sets of 48-inch Roos column clamps, were built by Johnson, Drake & Piper, Inc., the general contractor on the job.

NO LETUP IN CONCRETE PLACING is the rule during work on the $10 million barracks project at Fort Bliss, Texas, as International trucks with Smith mixers wait to replace one another to discharge concrete. Robert E. McKee, General Contractor, Inc., El Paso, Texas, has this job.



42X48 GRIZZLY-KING

—the largest and finest overhead eccentric jaw crushers made.

GRIZZLY-KING superiority

You just can't appreciate the superiority of a Grizzly-King overhead eccentric jaw crusher until you've seen one in action and talked to those who have them.

Owners will tell you about tremendous production capacity, continuous service records, low jaw-die replacement costs, freedom from servicing and adjustment, low power costs.

No wonder Lippmann Grizzly-Kings continue to dominate the giant size (30x42 to 42x48) as well as regular size (12x36 to 24x36) overhead eccentric jaw crusher fields. A Grizzly-King was the world's largest 8 years ago and a Grizzly-King is still the world's largest today — in size (dimension and weight), in output (up to 1200 tons per hour) and in maintenance savings (only lubrication in most instances).

That is why the country's largest producers of crushed stone set production and service records with these Lippmann giants . . . and why others are installing them *now*.

You can get Grizzly-King benefits only by using "Grizzly-Kings." And remember this . . . not one of these big Lippmann crushers — whether 42x48 or smaller — has ever failed or failed to satisfy. Learn about Grizzly-King's advantages by contacting your local Lippmann dealer or the factory direct, today. Lippmann Engineering Works, 4637 W. Mitchell St., Milwaukee 14, Wisconsin.

100-56-1

Typical comments from Grizzly-King owners everywhere: —

"Wouldn't have any other crusher but a Lippmann"

"Crushed 1,200,000 tons without turning jaw dies . . . and they're still going strong"

"During the 5 months it has been in service, it has required no adjusting or servicing except for lubrication"

"Maintenance? Haven't even replaced a die-bolt"

"Haven't turned my Grizzly-King dies even after 2½ million tons"

For more facts, use Reader-Reply Card opposite page 18 and circle No. 386

discovered the danger of picking up a full load of material and raising the scraper bowl. This placed the entire weight of the load on the tires, and several times the equipment mired badly in quaking, soft, waterlogged material. Scraper bowls had to be kept floating over the surface of the ground, operators timing the pickup of a whole load of material so that it was finished as the scraper arrived on the next stub road.

Six fast rubber-tire hauling units were assigned to this job, two units working with one push tractor whenever possible. Some of the pushers were equipped with dozer blades so that they could construct additional stub or main roads when they were not busy helping the scrapers.

The practical working depth of the borrow pit was extremely shallow, due to the high water table. In most instances, two passes by equipment was enough to produce visible ground water in one area. After the most outlying areas were covered by the scrapers, the good material in the then-useless haul roads was picked up. Material hauled to the fill was dumped and spread in 3-foot or 12-inch lifts, according to specifications.

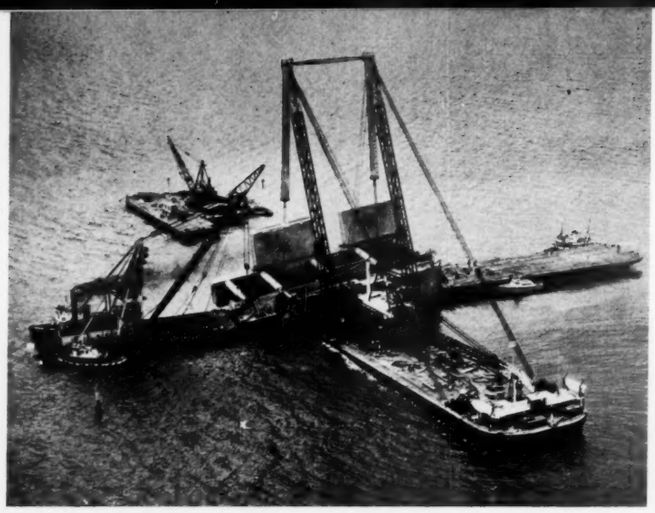
Completion of the test dike proves that contractors can make rubber-tire dirt-moving equipment achieve good production, even in adverse soil conditions like those on this job. Average production for Young & Smith on this job was about 5,000 cubic yards per 10-hour shift.

Personnel

Construction of the experimental embankment was under the general direction of E. O. Larson, regional director of the U. S. Bureau of Reclamation, with offices in Salt Lake City. Clinton D. Woods is project manager of the Weber Basin project, and L. R. Dunkley is construction engineer. H. Greenhalgh was acting resident engineer in charge of the test embankment. Robert Robinson is technical engineer on test equipment and installations. THE END

A calendar of coming conventions, of interest to our readers, appears on page 60 of this issue.

Construction camera



LIFTING A RECORD WEIGHT of 800 tons, this 240-foot-high rig designed by American Hoist & Derrick for J. Ray McDermott & Co. Marine Contractors of Harvey, La. is tested in the Gulf of Mexico. The shear-leg derrick is mounted in the stern of a 90 x 300-foot barge and is supported by cables going back to two hoists.

A 9-HOUR CONCRETE POUR, requiring 160 truck loads of concrete, completes the 4-foot-thick pressure floor of the Federal Reserve Bank of New York in Buffalo, N. Y. William L. Crow Construction Co., New York City, used American belt conveyors to carry concrete from the Jaeger mixers.

Publish statistical volume on water-borne commerce

A series of five books covering water-borne commerce for the past year, has been published by the U. S. Army Corps of Engineers. One of these is "Waterways and Harbors, Atlantic Coast, Part 1" of the publication, "Water-Borne Commerce of the United States". The 362-page booklet contains statistical and descriptive data covering about 500 Corps of Engineers projects in addition to material on the major coastal ports, harbors, and rivers on the Atlantic Coast from Maine to Florida.

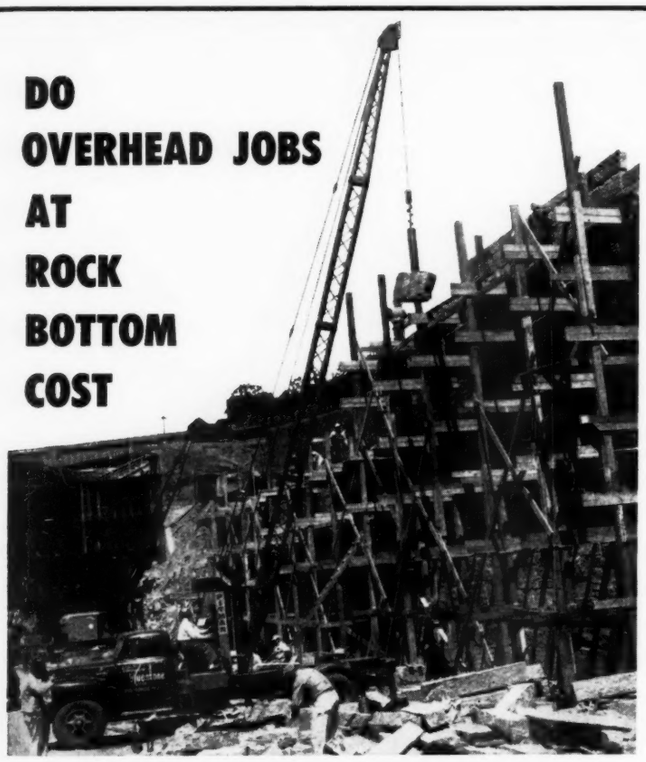
This publication is one of the series containing statistics, for each port or project, concerning depths, lengths, navigation seasons, comparative statement of traffic for a ten year period, and movements of domestic and foreign commodities and vessels. These figures are based on water-borne traffic activity reported to the Corps by vessel operators of record on prescribed forms approved by the Bureau of the Budget under the Federal Reports Act of 1942.

The volume is priced at $1.30, and may be ordered through the Division Engineer, New England Division, U. S. Army Corps of Engineers, 857 Commonwealth Ave., Boston 15, Mass., or U. S. Lake Survey Office, 630 Federal Bldg., Detroit 26, Mich. Checks or money orders must be made payable to the Treasurer of the United States.

Good Roads Machinery personnel news

W. F. Jahn has been appointed regional representative in the midwestern states for Good Roads Machinery Corp., Minerva, Ohio. Jahn, who will make his headquarters at Elgin, Ill., was formerly with Gar Wood Industries and the Elgin Sweeper Corp. His territory includes the states of Wisconsin, Minnesota, Michigan, Illinois, Iowa, Missouri, and Indiana.

DO OVERHEAD JOBS AT ROCK BOTTOM COST



with the amazing

Pitman CRANE
MODEL 80

- Capacity Up to 4 Tons
- Boom Lengths to 59'
- 180° Power Swing
- Mounts on Conventional Trucks
- Boom Folds Like Carpenter's Rule
- Precision Boom and Loadline Control

With Pitman Crane, Model 80, you now can do scores of jobs that formerly required a crane costing thousands of dollars more. And, because you can move it to the job and set it up so quickly, Pitman Crane does many of these jobs much faster, much easier. Get all the facts NOW! Pitman Crane could save you thousands of dollars in one season alone.

Pitman MFG. CO.
300 West 79th Terrace
Kansas City, Mo.

Send me complete details on the new Pitman Crane, Model 80, along with name of nearest distributor.

Name _____
Company _____
Street _____
City _____ State _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 387

The ONLY Self-Propelled Road Sweeper on the Market!

Little Giant SUPER Road Bird SWEEPER

FOR THE FIRST TIME an all-year-'round sweeper! Most advanced sweeper on the market . . . priced little higher than a tow sweeper! 4 cylinder water-cooled engine, automotive clutch and 4 speed transmission. Spicer-jeep axle; Ross steering gear; Wisconsin AEN engine drives brush independently of forward speed. Turning radius 17 feet. Brush turns 30° (approx.) . . . ideal for sweeping snow . . . handles dirt, trash, brickbats easily. Optional sprinkling system, deflector for windrowing sweepings, side shield, speedometer, engine hour meter, windshield and one-man cab.

LITTLE GIANT TOW SWEEPERS

Little Giant Tow Sweepers have BUILT-IN FLEXIBILITY to absorb road shocks and withstand hard use. Powerful in action, light in weight, easy to handle. Sweeps street surfaces clean before black-topping . . . assures a black-top surface free of bubbles and blisters. Ideal for leveling pea gravel; to sweep lime, rock or gravel back from shoulders; to clean up paving and road-building jobs, etc.

• VISIT OUR SUITE AT THE AED CONVENTION or write for prices and detailed specifications

LITTLE GIANT PRODUCTS, Inc. 1532 NORTH ADAMS ST. PEORIA, ILLINOIS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 388

FIFTY-ONE YEARS AGO, when these Bucyrus 95-ton shovels were digging the Panama Canal to grade, the first of the big slides to threaten shipping were still to take place. Since then 75 million cubic yards of material have been excavated to keep the canal open. Working on the latest such job, a Bucyrus-Erie 54-B with 2½-yard dipper clears dynamited rock at Contractor's Hill near the narrowest part of the canal. A crack had developed in the hill, and as it grew wider, threatened to send a slide 330 feet into the waterway. Tecon Corp., Dallas, Texas, excavated 4½ million tons of material as part of the job.

Building contractors form new trade association

The first state-wide group to promote the interests of general contractors has been organized under the name General Building Contractors Association of New York State. Formally organized at the convention of the Building Industry Employers of New York State, the new group will probably become an affiliate of the BIE.

Elected officers are: president Frank W. O'Connell, president of Frank W. O'Connell, Inc., Binghamton; first vice president, Daniel B. Niederlander, president of John W. Cowper Co., Buffalo; second vice president, Nicholas B. O'Connell, vice president of Turner Construction Co., New York City; secretary-treasurer, Adam G. Friederich, of Adam G. Friederich & Son, Rochester. Arnold Mitchell of Binghamton has been appointed executive secretary, and he will make his temporary headquarters in that city.

Members, officers elected by Asphalt Institute

Both the Sun Oil Co., Philadelphia, Pa., and Richfield Oil Corp., Los Angeles, Calif., were accepted as members of the Asphalt Institute at the annual meeting of the organization. This brings to 53 the number of asphalt-producing petroleum companies taking part in the Asphalt Institute's engineering, research, and educational program.

New officials elected at the meeting included Sidney Goldin, assistant to the vice president for marketing of Shell Oil Co., New York, N. Y., who was elected board chairman to succeed Hal B. Pullar, chairman of the board of the Berry Asphalt Co., Magnolia, Ark.

New divisional vice presidents elected are T. R. Ellis, The Texas Co., New York, N. Y.; Floyd Reed, American Bitumuls & Asphalt Co., Cincinnati, Ohio; Don Fox, Derby Refining Co., Wichita, Kans.; Robert Ketcham, Anderson-Prichard Oil Co., Oklahoma City, Okla.; and Don Nielsen, Union Oil Co. of California, Los Angeles.

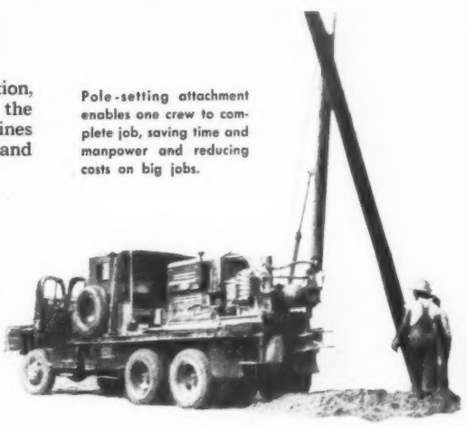
JAQUES
HYDRAULIC EARTH-BORING MACHINES

Bore Holes Faster, Cheaper

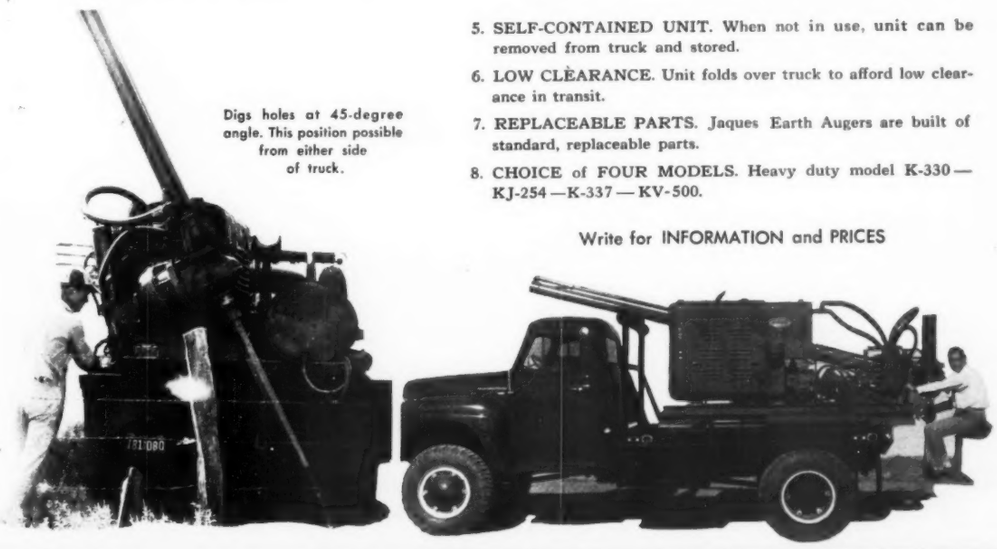
For speed, dependable performance and economy of operation, Jaques Earth-Boring Machines will out-perform any on the market, no matter how tough the job or the soil. These machines are the result of a third of a century of research, pioneering and experience in building earth augers. Note these features:

1. EASE OF OPERATION. All operations hydraulically controlled, with control levers grouped together for ease and speed of handling.
2. AUTOMATIC REGULATION. Hydraulic feed automatically regulates the speed of cutting to suit the texture of the soil. Holes are dug faster.
3. ANCHOR HOLES. Anchor holes as well as vertical holes may be bored easily . . . 45-degree position either side of truck.
4. SIZE and DEPTH OF HOLES. Any size bit, 9-inch to 60-inch diameter, may be used. Hole may be bored to a depth of ten feet. Built to dig holes up to 30 feet at additional cost.

Pole-setting attachment enables one crew to complete job, saving time and manpower and reducing costs on big jobs.



Digs holes at 45-degree angle. This position possible from either side of truck.



5. SELF-CONTAINED UNIT. When not in use, unit can be removed from truck and stored.
6. LOW CLEARANCE. Unit folds over truck to afford low clearance in transit.
7. REPLACEABLE PARTS. Jaques Earth Augers are built of standard, replaceable parts.
8. CHOICE of FOUR MODELS. Heavy duty model K-330 — KJ-254 — K-337 — KV-500.

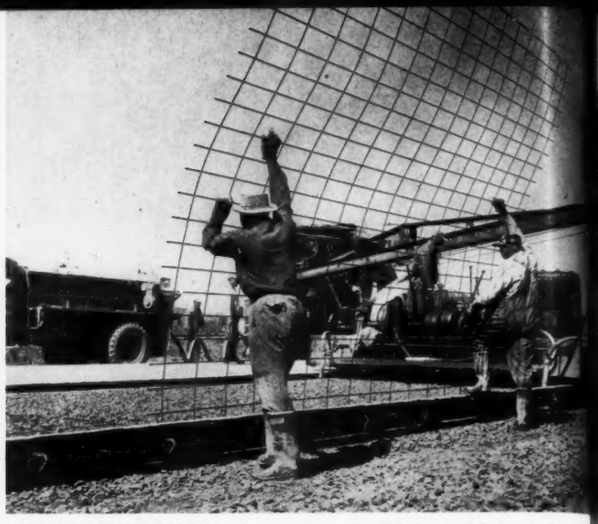
Write for INFORMATION and PRICES

JAQUES EARTH AUGER CO.
BOX 298, DENISON, TEXAS — 7114 HARRY HINES BLVD., DALLAS, TEXAS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 389

Construction camera

EVEN ON SMALL JOBS, a big rig shows itself useful. This Euclid S-7 scraper, one of a few owned and used for a variety of jobs by Ouachita County, Ark., here dumps gravel in a fill section during reconstruction operations on a county road. The earthmover is kept busy the year 'round.



WORKMEN STAND READY to place a sheet of welded wire fabric reinforcing as a Jaeger spreader passes by in this 24-foot lane of the North-East extension of the Pennsylvania Turnpike between Kulpsville and Franconia. James D. Morrissey, Inc., Philadelphia, Pa., has a 4½-mile contract.

Big bridge trusses travel to site on special cars

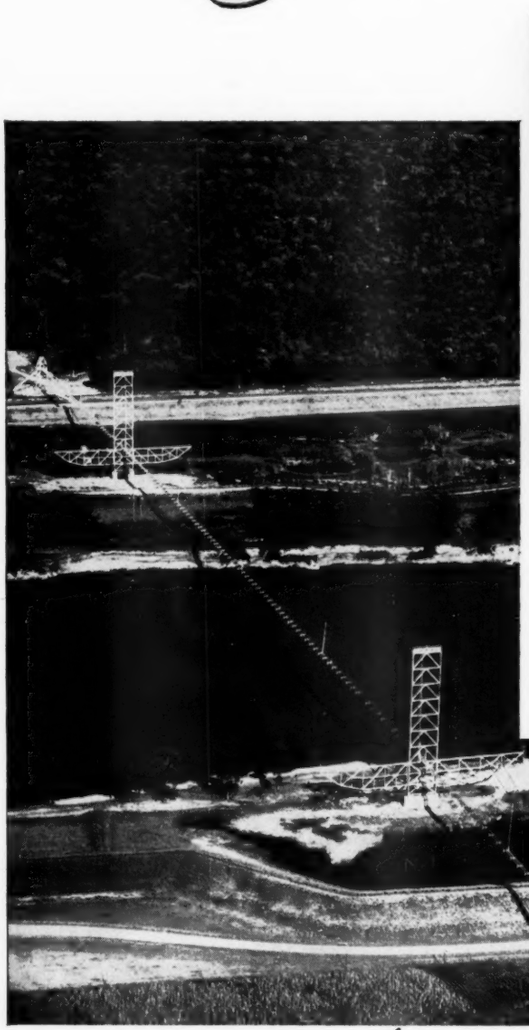
Some of the trussess for the $90 million Walt Whitman Bridge across the Delaware River are so big that they have to be shipped to the work site on specially rigged and counterweighted flatcars. Even so, the bottom chords of the trusses ride only 6 inches above the rails. Altogether, 173 of the trusses, 16 feet deep and nearly 87 feet long, are going into the bridge. The largest steel sections in the bridge, the trussess are being fabricated and assembled at the Bethlehem Works of Bethlehem Steel Co. and shipped to the job ready for erection.

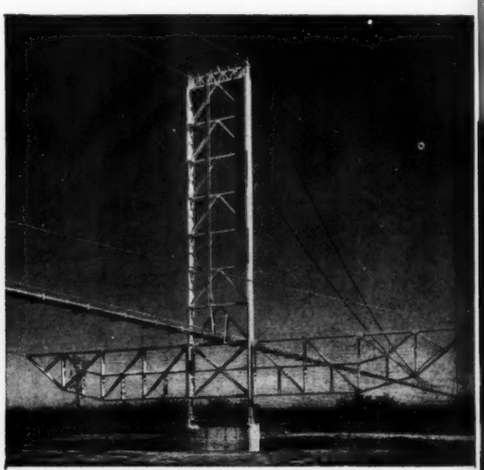
This 275-foot-long shipping unit has a steel support frame bolted to the deck of a flatcar. This provides a swivel plate extending from the car. Each end of the trusses is held to these swivel plates by a 2-inch-diameter pin, so that trusses serve as a coupling without interfering with the operation of the flatcar. A flexible air hose is wired to the bottom chord of the trusses to connect the air braking system of the cars.

Shipments of trusses are being made in special trains, consisting of two units, a locomotive and caboose. When trusses have been stored at Burma Yard, a Pennsylvania Railroad storage site at Philadelphia, cars return to Pottstown coupled with a special draw bar also equipped with flexible air hose.

From shore, the floor trusses will be moved out on the Delaware River on car floats as needed, then hoisted into place by derricks on travelers. The 11,733 tons of roadway steelwork will be suspended from cables held aloft by two 370-foot-high towers, one on the Gloucester City shore, the other on the South Philadelphia shore. This spring, travelers will work out from opposite towers, setting steel for the bridge, which will have a length of 3,770 feet between anchorages. The seven-lane span, which will have a vertical clearance of 150 feet above water at the center line, is expected to be opened to traffic by the Delaware River Port Authority early next year.

Tiger Brand is the R fo





Rope Bridge For A Pipeline

This unique suspension bridge on the Atchafalaya River near Melville, Louisiana, carries two 30" lines on the main line of Transcontinental Gas Pipe Line Corporation. With the exception of the towers the entire structure is made of galvanized Tiger Brand Wire Rope. Rope is used not only to suspend the two pipes but also to stiffen them horizontally to resist wind loads. Approximately 20 miles of rope were used in this bridge and every inch of it is Tiger Brand because of Tiger Brand's known high quality and dependability.

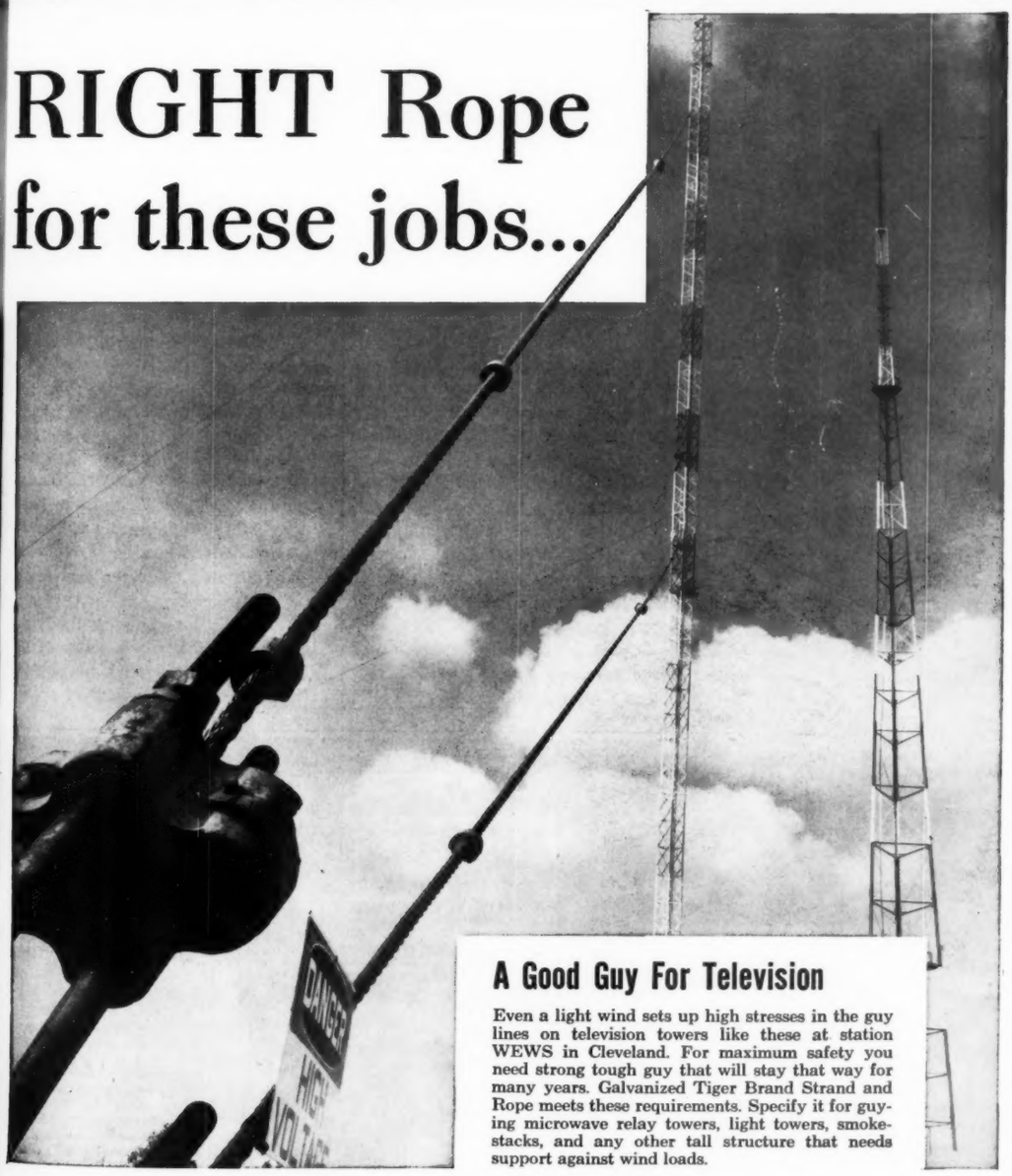
On Any Job

Hundreds of combinations of strengths, sizes, constructions, lays, and steels are available in the complete line of Tiger Brand Wire Ropes. As a result, you can get a Tiger Brand Rope to suit every lifting job you will ever encounter—and you can depend on its performance. Tiger Brand has proved in actual service that it lasts long. Get in touch with your local Tiger Brand Distributor next time you need dependable wire rope.

CONSTRUCTION OF ACCESS ROADS—probably one of the more pressing jobs at the site of the St. Lawrence Seaway and power project near Massena, N. Y., is being taken care of fast. A Caterpillar diesel DW20 tractor with No. 20 scraper push-loaded by a Cat D8 with No. 8S bulldozer is bringing this road to grade.

EXCAVATION IS CARRIED DEEPER for the $4 million Dalecarlia water plant in Washington, D. C., by two Lorain-26 clamshells. The project is being constructed under a U. S. Army Army Corps of Engineers contract by Cramer & Vollmerhausen Co., Inc., also of Washington.

RIGHT Rope for these jobs...



A Good Guy For Television

Even a light wind sets up high stresses in the guy lines on television towers like these at station WEWS in Cleveland. For maximum safety you need strong tough guy that will stay that way for many years. Galvanized Tiger Brand Strand and Rope meets these requirements. Specify it for guying microwave relay towers, light towers, smokestacks, and any other tall structure that needs support against wind loads.

AMERICAN STEEL & WIRE
DIVISION
UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE
Excellay Preformed
USS
UNITED STATES STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 390

Job directory is issued for engineering personnel

The new 1956 edition of "Engineers' Job Directory", listing job openings for qualified civil engineers in private industry, has been published by Decision, Inc.

A typical company listing gives the correct firm name, its address and date of founding, the size of the firm, products manufactured, and the name of the person to whom job inquiries should be addressed. Openings are listed in the 1956 edition for 236 major firms.

Copies of the "Engineers' Job Directory" may be obtained from the publisher, Decision, Inc., 1483 First National Bank Bldg., Cincinnati 2, Ohio. Copies are priced at $3.25, including postage.

World highway spending reaches new record level

Highway expenditures reached an all-time high in 1955 throughout the nations of the free world, coming to an estimated $10,875,000,000.

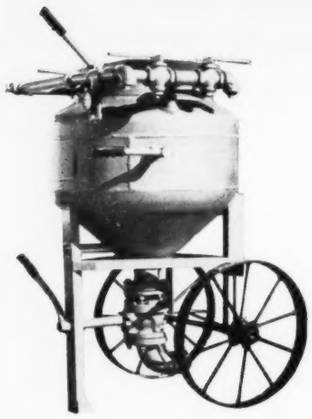
Of this, an estimated $3,700,000,000 was spent outside the U. S. Expenditures for all highway purposes at all levels of government in this country came to $7,175,000,000 last year. Canada, with $600,000,000, ran second to the U. S. in road expenditures. Ranking third was West Germany, which spent almost half a billion dollars on roads.

European countries spent about $1,600,000,000 on highways; Asian countries, $600,000,000; Latin-American nations, $350,000,000; Australasia, $275,000,000; and Africa, an estimated $260,000,000.

Porter acquires two firms

The business of Henry Disston & Sons, Inc., Philadelphia, Pa., has been acquired by H. K. Porter Co., Inc., Pittsburgh. The firm will be operated as the Henry Disston Division.

At the same time, Porter also acquired Carlson & Sullivan, Inc., of Monrovia, Calif. The firm, manufacturer of rules and measures, will operate as Carlson Rules and Measures, Henry Disston Division, H. K. Porter Co., Inc.



It's the
PREHY
Grouter & Placer

(in the size and model to meet your job requirements.)

that affords BIG SAVINGS and a job well done.

★ ★ ★

A machine for every need—from the hand pump grouting-in of reinforcing rods to pneumatic placing of ¾" aggregate mixes in forms.

Write for descriptive literature

PREHY COMPANY 420 Lexington Ave., New York 17, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 391

SUPERIOR

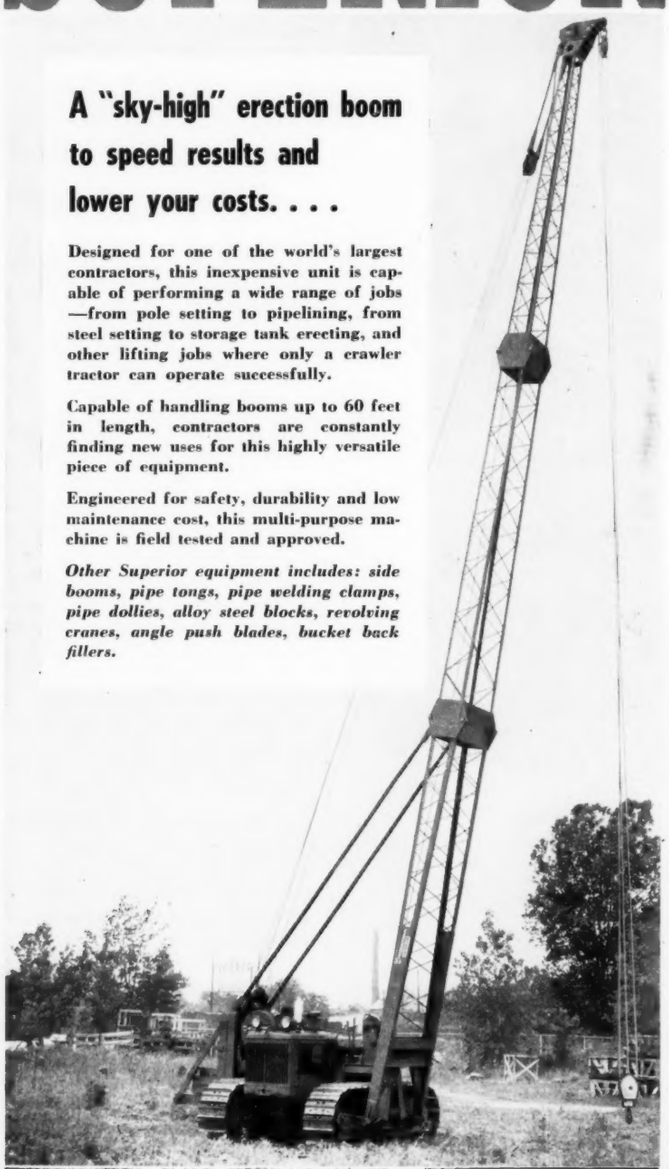
A "sky-high" erection boom to speed results and lower your costs. . . .

Designed for one of the world's largest contractors, this inexpensive unit is capable of performing a wide range of jobs —from pole setting to pipelining, from steel setting to storage tank erecting, and other lifting jobs where only a crawler tractor can operate successfully.

Capable of handling booms up to 60 feet in length, contractors are constantly finding new uses for this highly versatile piece of equipment.

Engineered for safety, durability and low maintenance cost, this multi-purpose machine is field tested and approved.

Other Superior equipment includes: side booms, pipe tongs, pipe welding clamps, pipe dollies, alloy steel blocks, revolving cranes, angle push blades, bucket back fillers.



Superior EQUIPMENT CO.
BUCYRUS, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 392

The last of approximately 900 piles supporting the $1,500,000 Broadway overhead is driven to bearing by a crawler-mounted pile driver with a single-acting steam hammer operating in 96-foot leads. Piles, driven to 50 tons bearing, range in length from 24 to 56 feet.
Jack Kennedy Photo

Three types of structure built

The opening of the $1,500,000 Broadway overhead in Council Bluffs, Iowa, a half-mile-long structure spanning eight tracks of two major railroads, eliminates hazardous grade crossings for the several important highways converging at the city before they cross the Missouri River into Omaha, Nebr. Designed by Howard, Needles, Tammen, & Bergendoff, and built for the Iowa State Highway Commission by Larsen Bros., Council Bluffs, the long overpass actually consists of three kinds of structures.

One type, located at each end of the overhead, consists of 200-foot-long retaining walls along each side, containing compacted crushed-rock fill. These approach sections bring the grade from street level to a 7-foot height.

Cellular abutments, 400 feet long on the east end and 320 feet long on the west end, are enclosed with curtain walls on all four sides. The beam-and-slab deck section rests on columns built into the curtain walls and is supported on a grid of concrete piles extending up to the bottom of the deck beams.

Between the abutment sections the bridge consists of a series of 18 reinforced-concrete piers supporting structural steel girders. Girder spans

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the torch with the
SQUARE BURNER

NEW!
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Designed and constructed by Anthes, a firm famous for torch and flare equipment in the trucking industry. Here is a unit that is leak-proof, self-righting, long-burning—and ruggedly made to perform faithfully under the most adverse weather conditions. Baked enamel body and burner. Chain for carrying. Write for complete data and prices. Anthes Force Oiler Co., Ft. Madison, Ia.

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WEATHERCAP
The protector of engines with vertical exhaust pipes

Areas open for distributors.

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The 20-foot-long sheet metal tremie is moved to a center column for an initial 4-cubic yard pour. Each of the four sections of the tremie has a baffle to prevent segregation. Successive lifts are made after one-hour intervals. *C&E Staff Photo*

ilt for half-mile overpass

range from 48 to 104 feet. Maximum pier height is the 33.84 feet of pier 11, which has a 3-foot thick concrete footing. A reinforced-concrete slab nominally 7½ inches thick completes the deck section.

Separated roadways

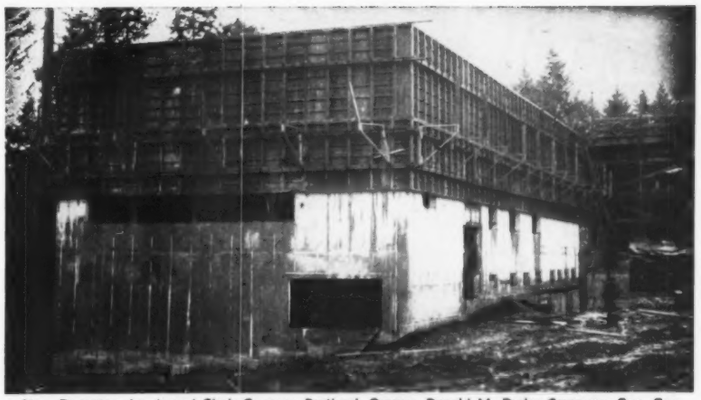
The normal deck cross section has two 26-foot roadways separated by a 4-foot raised median 7 inches high. Roadway slabs are not crowned, but slope away from the median at ¼ inch per foot.

On the north side an 8-inch curb is topped by a guardrail. Outside this there is a 6-foot-wide pedestrian sidewalk. On the south side there is the 8-inch curb and an emergency walk 2 feet wide. Outside the walks on both sides are steel railings consisting of H-beam posts and channel rails.

The eight steel girders, 33 and 36-inch WF rolled beams, span the 1,394 feet between abutments in four sections ranging in length from 216 to 498 feet. Each of these sections is continuous over several piers. Girder splices are designed for 100 per cent of the moment capacity of the smaller of the two beams being spliced.

One approach grade is 3.35 per cent, the other is 4 per cent, and

(Continued on next page)



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24′ wall poured in two lifts with Symons Forms. Scaffolding attached to forms makes easier setting and stripping of top forms. Note absence of bracing and minimum waling.

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Tough and Ready

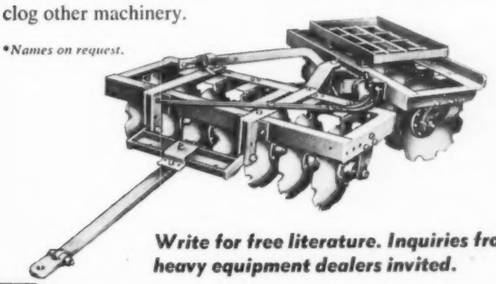
for the hardest compaction and land-leveling jobs

TOWNER SCARI-PLOW

Leading contractors* use the Towner Scari-Plow for cutting fill on dams, levees and roads...for maintaining road shoulders ...and for loosening dirt in borrow pits. A powerful three tons in weight and with giant, 28-inch diameter, razor-sharp disc blades, the Towner Scari-Plow gives speed and efficiency to the toughest compaction and land-leveling jobs.

Here's the plow built for tough going! Proved for 15 years, it penetrates the hardest soil with a double-plowing action that leaves the soil loose and finely broken, with no large chunks to clog other machinery.

*Names on request.



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Contractors, don't let cold weather delay construction, slow down production, increase costs. The Clayton Summeraire portable, oil-fired space heater dries out new construction; prevents freezing of concrete while curing; thaws out ground, materials and equipment; keeps workmen warm. Summeraire . . . priced 20-30% lower than other heaters of less capacity . . . delivers 2400 cu. ft. high velocity heated air per minute at low cost; 300,000 BTU's per hr. Available with electric or gasoline engine drive. Send coupon for details.

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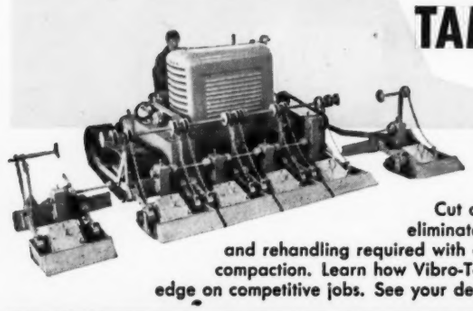

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(*Continued from preceding page*)

both are connected by a long vertical curve. This gives the structure a graceful appearance and provides easy driving grades and good sight distance.

Sewer and water work

Before work could start on the bridge, an extensive adjustment of sewers, water mains, and other utilities was done by Council Bluffs Construction Co. under a subcontract. In this case, 2,560 linear feet of 20-inch cast-iron water main was laid; approximately 2,000 feet of sanitary sewer—most of it 27-inch vitrified clay pipe—was installed; and 2,000 feet of 15 to 24-inch storm sewer was constructed to provide drainage for the structure and the surrounding area.

Taking advantage of the unusually mild weather, the subcontractor worked through the winter, losing only 4½ days because of cold weather. Quick-Way and Northwest backhoes excavated trenches and lowered the pipe into place. Two Caterpillar D4 tractors with dozers pushed the spoil banks back into the trenches, where the material was compacted in 6-inch lifts by pneumatic tampers powered by a Le Roi compressor.

During this sewer construction, 48 and 54-inch reinforced-concrete pipes had to be jacked almost 250 feet under both railroads. Workmen excavated by hand inside the pipes, while two 100-ton jacks pushed the big concrete sleeves under the tracks. The longest single push was 66 feet. Work on the sanitary sewer and the water main was completed in less than five months, making the area ready for the bridge contractor in the spring of 1954.

Concrete piles support

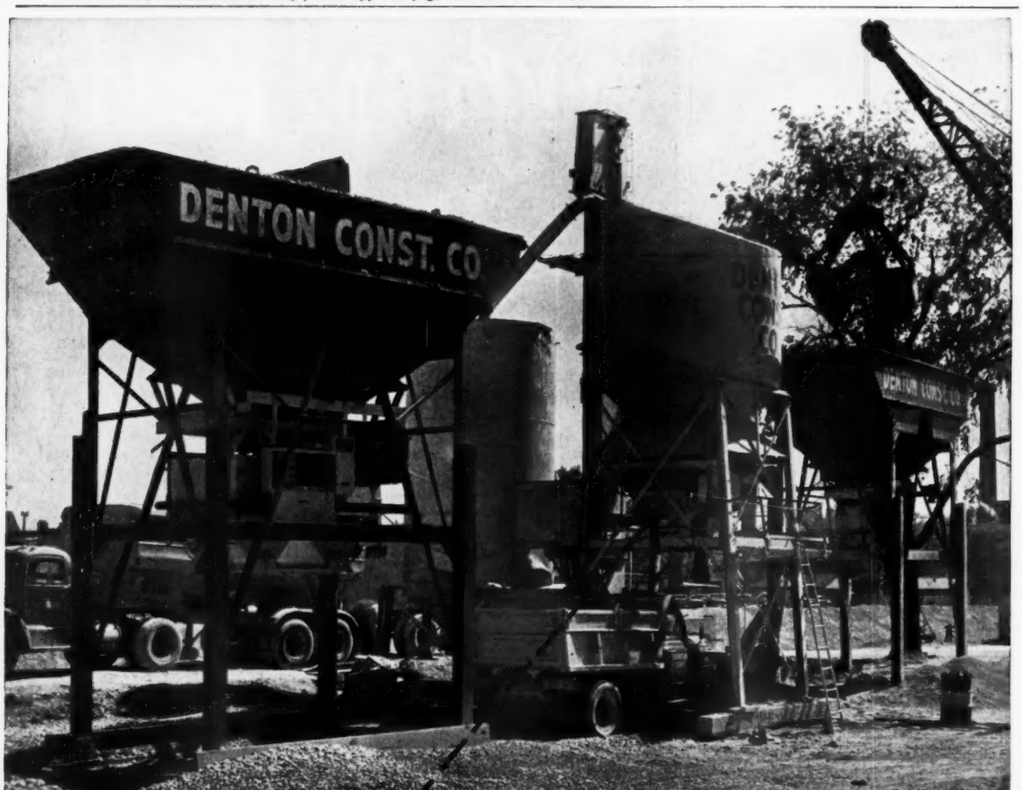
Using just one crawler-mounted self-propelled pile driver with 96-foot leads and a single-acting steam hammer, Raymond Concrete Pile Co. drove nearly 900 piles averaging about forty feet in length in 46 working days. This, an average of practically 20 piles per day, was bettered when the crew drove 31 piles in 6 hours one day. Piles driven through clay and fine sand to 50 tons bearing, ranged in length from 25 to 60 feet.

Where possible, the steel shells of the Raymond piles were filled with concrete chuted directly from transit-mix trucks. At times, however, the driving crew got so far ahead of the concrete placing that the neighborhood kids had an opportunity to get into the act. They tossed cans, survey stakes, sticks, and other available materials into the open shells, and all this had to be fished out before concrete could be poured. Pile shells for the cellular abutments were left projecting 10 feet or more above the ground and were filled with the aid of a crane and bucket.

The pile-driving crew finished its part of the work more than a month ahead of schedule, and the general contractor did not let the pace slacken. The shallow footing excavations, normally about five feet deep, had already been dug before the piles were driven, allowing footing forms to be placed and concrete poured just as soon as the pile driver moved out. Because of the great variety in the shape and size of footings, wood forms were constructed to fit each condition, and footing reinforcement was tied in place.

Pier forms prefabricated

Since most of the piers were similar, forms were prefabricated and reused many times. The standard pier consisted of three columns, 3×4 feet in cross section, ranging up to about 25 feet in height and spaced 23 feet center to center. Across the tops of the three columns was a beam 3 feet wide and 4.5 feet deep with rounding haunches, which joined the columns



You Can Bid any Road Job Successfully with this One-Man Operated Plant

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Controls for any specified concrete proportions are pre-set. Until the specifications change, complete batching is achieved at the touch of push buttons . . . Savings in man power, time and costs are correspondingly great.

This development of the BUTLER one-man operated Automatic Roadbuilders Plant is a logical answer to the enormous increase in highway construction. The roadbuilder must consider realistically the sharply cut costs this plant provides; now the owner of a BUTLER Automatic set-up can bid any paving job successfully and make a greater profit. On the other hand a contractor with yesterday's plant may find he can get no work at all.

Write for the new Bulletin completely describing the new BUTLER 0-1-0. Just a postcard will do — but send it today.

BUTLER BIN COMPANY
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and a tapered overhang cantilevered out on each end.

Column forms were built of ¾-inch Plyform, with 2×6 vertical backers spaced at 12-inch centers. Universal steel column clamps held the form sections together. A Link-Belt Speeder LS-85 crane set the form panels and the prefabricated reinforcing cages which fit inside. When the three column forms for a pier had been set, the bottom forms for the cap beams were placed and attached to the columns. This provided a platform for the workmen placing concrete in the columns.

Before the column forms were poured, they were drawn into perfect alignment by the use of two 6×6-inch steel H-beams which spanned between the three columns just under the cap. Three cables on each side of the pier tied the beams to anchors in the ground. These beams and the column forms remained in place until after the caps had been formed and poured.

To pour the high columns without segregation of the concrete, the contractor built a special tremie of four sheet metal sections, each about five feet long and measuring 6×24 inches in section. Each had a baffle built into it, and the top section was attached to a flared hopper for easy pouring. Four cubic yards of concrete were poured into each column in a lift. For the first lift, the tremie was lowered into the column by the Link-Belt Speeder crane and tied to the reinforcing cage. Concrete, delivered to the job in Challenge 5-yard transit mixers on International R-190 trucks, was bucketed to the tremie hopper in two Gar-Bro ½-yard bottom-dump buckets by the crane.

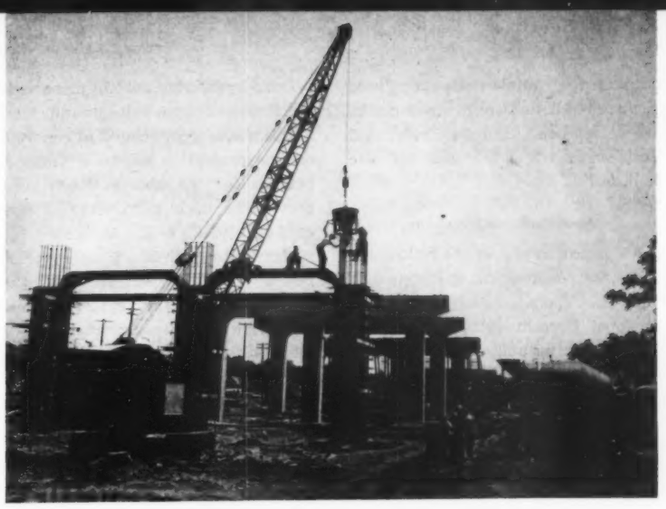
When the 4-yard lift had been placed in the first column, the tremie was moved to the second column and the process repeated. This lift was poured in all three columns before the lower section of the tremie was removed. Then the tremie was again inserted in the first column, and allowing an hour for the first lift to attain its initial set, the second lift was poured in the same manner. The third lift brought the concrete up to the bottom of the haunch and completed the column pours.

Prefabricated form panels for the pier caps were then placed on the beam bottoms. These sections consisted of ¾-inch Plyform sheathing backed by 2×4 studs at 12-inch centers and double 2×6 wales. Side forms were tied with Universal Spiroloc cone nut assemblies. The cap form was supported by double 6×6 shores resting on column footings. Using two buckets at the rate of about 1 minute and 15 seconds per half-yard bucket of material, the crane placed the concrete, and a Jackson vibrator consolidated the mix in both column and cap pours.

To strengthen the pier against impact near the bottom of the columns, and to provide a smooth flat surface which would tend to guide a derailed car away from the columns, collision struts were placed between the columns of the three piers which closely

(*Continued on next page*)

For more facts, circle No. 399→



One of the Gar-Bro ½-yard buckets is filled from a Challenge 5-yard transit mixer on an International R-190 truck, while a second bucket handled by the Link-Belt Speeder LS-85 makes a pour on a pier. *C&E Staff Photo*

15 ways to save time and materials on curb, gutter and sidewalk jobs...

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When joints are 5 to 10 feet apart

When joints are not 5 to 10 feet apart

For curved work of variable radius

When joints are not 5 to 10 feet apart

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When joints are 5 to 10 feet apart

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CURB FORMS

SIDEWALK FORMS

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Integral curb form with battered exposed face

Integral curb form with battered exposed face

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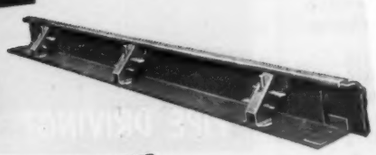

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Self-aligning road forms save time and expense on highway paving, too. They will assure you of rapid form setting always true to line and grade. Road forms are available in heights of 8" or more and Airport forms in heights of 12" or more.

This "Complete Package" of forms can be used over-and-over again to build any of the cross sections shown above and *build them faster at a lower cost.* If curb, gutter and sidewalk building is part of your business, you can save time and material expense with these Blaw-Knox Universal steel forms. They are the only *completely standardized* forms that can be used interchangeably on many different jobs so you can take on a wide range of jobs with a low investment in forms. They are self-aligning, easy to set and strip and practically eliminate hand finishing. For complete details, see your Blaw-Knox distributor.

BLAW-KNOX

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CONSTRUCTION EQUIPMENT DIVISION

Mattoon, Illinois

parallel the railroad tracks. These struts, placed just above track grade, are 4 feet deep, 2.75 feet wide, and flush with the track side of the columns.

Abutment construction

A substantial part of the 9,300 cubic yards of concrete in the structure went into the big cellular abutment sections. Curtain walls around the exterior of the abutments were cast in sections with prefabricated forms. These were used first on the high sections, then were cut down for use on lower sections. Exterior columns were formed and cast integral with the curtain wall. Inside the structure was a grid of Raymond Concrete piles extending above ground level to the elevation of the bottom deck beams.

Deck forms were built in place with prefabricated beam bottoms and sides. Plank plates were bedded in concrete on the ground to assure a uniform bearing for the shores which supported the deck form. Shores were of 2×4 and 2×6 planks, spiked together in the form of a T. Beam forms rested on 2×10 stringers on the shores. The form for the 10-inch concrete deck slab was supported by 2×8 joists, resting on ledges on the sides of the beam forms and supported between by T-shores. The deck form was ¾-inch Plyform.

The crane - and - buckets method used to place concrete for the piers was also used in placing concrete for the abutment decks. Doors in the curtain walls at one end of the abutment, permitting access to the inside of the

An expansion joint inside the bulkhead in a retaining wall form is filled with ½-inch Servicised sponge rubber expansion joint material. Nails left projecting into the concrete, anchor the material to the concrete when the bulkhead is removed.

C&E Staff Photo

structure for inspection or storage purposes, allowed men to remove forms for the last section poured. Expansion joints in the walls and floor of the abutments were made with Servicised ½-inch sponge-rubber expansion joint material.

Once the structural steel deck girders were in place, the form for the concrete deck was built up from the lower flange of the girders. The 8-foot space between the girders was spanned by 2×8 joists at 2-foot centers. Deck sheathing was ¾-inch Plyform. After 1-inch pipe screeds were set in the deck form, the concrete was struck off with a Master vibrating screed powered by a Wisconsin engine.

The concrete deck slab was belted and given a final finish with a burlap drag. The face of the curbs and the exterior surfaces of the structure were given a rubbed finish after forms were removed. The plywood sheathing of the piers and abutments left a finish which required only minor patching of holes left by form hardware and a small amount of honeycombing.

All concrete for the structure was supplied by Hydraulic Concrete Products, Inc., Council Bluffs. The mix was designed for 3,000-psi compressive strength and 450-psi beam strength, and typical batch weights called for 688 pounds of cement and about 1,400 pounds each of sand and crushed limestone. Maximum aggregate size was 1 inch. Concrete, used for the entire superstructure, had an air content maintained between 4 and 6 per cent. Maximum slump was 4 inches.

The crushed rock fill placed between the retaining walls of both

Now, Machines that 'Specialize' in Big Tract, Low Cost-per-Acre
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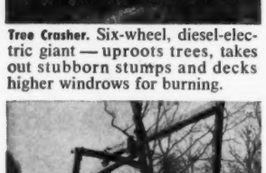
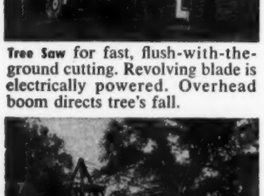
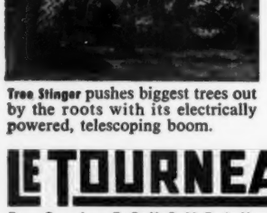


Tree Crusher. Six-wheel, diesel-electric giant — uproots trees, takes out stubborn stumps and decks higher windrows for burning.



Tree Saw for fast, flush-with-the-ground cutting. Revolving blade is electrically powered. Overhead boom directs tree's fall.



Tree Stinger pushes biggest trees out by the roots with its electrically powered, telescoping boom.

Powerful LeTourneau Land Clearing Equipment has been developed, tested and proved-by-use on all kinds of clearing jobs — including forest, brush, and lowland vegetation—where job specifications varied from flush-cut stumps to root systems completely removed.

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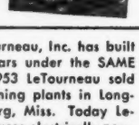
These giant machines are surprisingly easy to operate and are so efficient the initial investment is soon recovered by quicker clearing with much smaller crews.

Send for Land Clearing Booklet describing these machines for BIG land clearing jobs.



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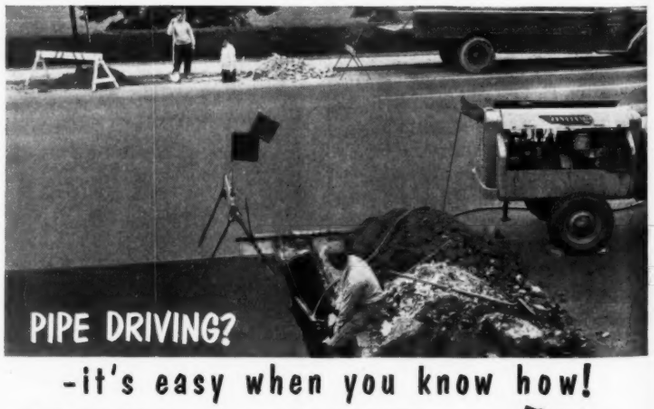

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bridge approaches was obtained from the 11,000 square yards of old concrete paving removed at the start of the job and run through a crusher. A 10-inch concrete slab was poured over the crushed rock fill to form the roadway.

Grading and paving of both approaches were done under a separate contract by General Contractors, Inc., Omaha. This involved 16,000 cubic yards of grading and 18,400 square yards of 9-inch concrete pavement with 6-inch curbs on both sides.

Furnishing and erecting of the bridge lighting was sublet to Industrial Electric Co., Omaha. Conduits encased in the concrete deck carry current for the 2,300-volt lighting system, and steel poles with luminaires provide adequate lighting for the roadway and surrounding area.

Stairways are provided at points where the structure passes over streets so that pedestrians may get from the streets to the bridge deck. These steel stairways rest on concrete footings and lie outside the edge of the bridge proper.

During the warm weather, workmen on this job had a supply of cool sanitary drinking water available at all times through the use of Igloo insulated water containers and Puritan paper drinking cups.

Personnel

Co-superintendents Ed and George Larsen supervised the work for Larsen Bros., the general contractor. N. M. Stanhiser was in charge of the Raymond Concrete Pile Co. crew. Joe Boltz supervised the sewer and water work done by Council Bluffs Construction Co. The project was constructed under jurisdiction of the Council Bluffs District of the Iowa State Highway Commission, of which Virgil Butler is the district engineer. R. H. McIntire, resident engineer on the project, was assisted by Clark Jensen, chief inspector. John G. Butler is chief engineer of the Iowa department. THE END

Crushing equipment

■ The Diamond Iron Works' complete line of crushing and handling equipment—stationary and portable crushing plants, jaw and roll crushers, conveyors, feeders, storage bins, scalpers, and hammermills—is shown in a catalog from the company. Pictures, flow charts, specifications, and the unique features of the machinery are given.

To obtain Catalog D-106 write to the Diamond Iron Works Division, Goodman Mfg. Co., Halsted Street and 48th Place, Chicago 9, Ill., or use the Request Card at page 18. Circle No. 168.

Prime-Mover builds new factory facility

Under construction for the Prime-Mover Co., Muscatine, Iowa, is a new 180 × 220-foot steel and masonry factory building for the manufacture of powered wheelbarrows. Located on U. S. 61, a mile east of Muscatine, the new building will be ready by May.

For more facts, circle No. 402→

Transportation engineering types covered in new book

A combined treatment of several types of transportation engineering is presented in a new book published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. The book is divided into six parts: roads and pavements; airport engineering; railroad engineering; river and coastal engineering; pipeline transportation, and transportation of material and passengers by belt conveyors.

Part one covers such material as foundation soils, grading, stabilized roads, bituminous materials, intermediate types of pavement structure, high-type bituminous pavements, portland-cement concrete, drainage, and maintenance.

Part two includes airport planning, site selection, design standards, layout, grading, drainage, and pavements. Grading, turnouts, sidetracks, yards, and various types of locomotives are some of the things included in the third section of the volume, while water transportation, river hydraulics, channel regulation, locks and dams, ports and harbors, breakwaters and jetties, coastal structures and port structures are covered in part 4. The section on pipelines discusses preliminary survey, design procedure, and construction requirements. Belts, power, belt tension, selection of a conveyor belt, and passenger conveyors are contained in the last section of the volume.

"Fundamentals of Transportation Engineering", by Heunes and Ekse, was written after consultation with authorities in the field, so that authentic and up-to-date planning, design, and construction standards and procedures are provided. The 520-page liberally illustrated book may be obtained from the publisher at $8.50 per copy.

"Oh yes it can!" said Darin & Armstrong Detroit contractors..."with Atlas Compo Forms!"

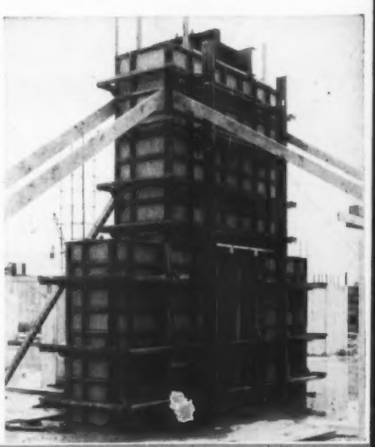
There was plenty of reason to doubt that prefabricated forms could be used to pour the huge addition to a Michigan automotive plant. The job included battered walls with a big haunch; walls that had to be poured against an existing structure; and forming that had to be half completed before ties could be inserted.

But Darin and Armstrong carefully studied the job requirements and decided Atlas Compo Forms offered the very best way to handle all problems and get the job's 60,000 yards of concrete poured within contract time.

Result: the job progressed smoothly and on schedule from the very beginning. Even the trickiest parts of the forming were done in stride.

Whenever you have a job when repeated-use forms might be used, confer with Irvington engineers. They probably can save you time and money.

So much steel reinforcement went into this wall that form ties had to be inserted *after* both sides of the forms were up. With the exclusive Compo tying system this readily can be done.



Y-shaped piers 17' high, formed with Atlas Compo form sections and steel channel yokes, were poured continuously. 90% of internal tying eliminated. Stripped forms crane handled in large units eliminating reassembly.

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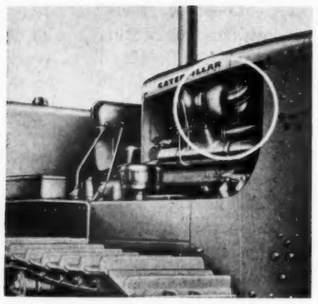
The new turbochargers

What do they do?
How do they operate?
What are their limitations?



The location of the turbocharger, on Caterpillar's powerful new D9 tractor is shown here, circled. Sealed governor, fuel pump housings and nozzle ring on the turbocharger are designed to discourage tampering.

The turbocharger-equipped D9 and the redesigned DW20 and DW21 introduced in 1955 are giving users of this Caterpillar equipment two big advantages. First, the machines are meeting engine overload better, and second, they are working with more efficiency. Though prices for different arrangements vary, even the most expensive unit should pay for itself in 4,000 hours of operation on fuel priced at 14 cents a gallon.

The total effect of the turbocharger is to reduce stress on the working parts of an engine and allow a better matching of the engine to load requirements. Owners, prospective owners, and operators can get the most out of this equipment if they keep in mind the operation of the unit and its limitations.

How it operates

The turbocharger works something like a windmill, except that it pumps air instead of water. Driven by exhaust gases that were formerly wasted, it increases the volume of air fed into an engine so that greater amounts of fuel can be burned more efficiently. The result: greater horsepower and improvement over the diesel engine.

The diesel has air drawn into a cylinder on every other downward stroke of the piston. As the piston moves up, this air is compressed and becomes hot, igniting fuel injected into the cylinder. This action builds up a pressure which forces the piston down, turning the crankshaft.

The amount of air drawn into the cylinder determines the quantity of fuel that can be injected into the engine. More fuel has to be consumed to obtain more power from the engine, but this means that more air is needed to burn the fuel. This can be provided by a supercharger, such as a blower driven by an engine or a turbocharger driven by exhaust gases. In 1949, when Cat industrial engines were equipped with gear-driven blowers that forced more air into cylinders and made the injection of more fuel possible, turbochargers had not yet been perfected for heavy-duty engines.

The turbochargers introduced on Caterpillar equipment last year maintain air-flow at a higher rate than a gear-driven blower as overloads slow down an engine. This higher flow of air makes it possible for more fuel to be injected into the cylinder so that the engine meets overload better. They also make for greater engine efficiency, since horsepower formerly needed to drive the gear-type blower is now available for useful work. The operator benefits too, for with the turbocharger connected to the exhaust pipe, engine noise is silenced.

Basically, the turbocharger consists of two fundamental parts, an exhaust gas turbine and a compressor. The turbine wheel, located in the exhaust line of the engine and driven

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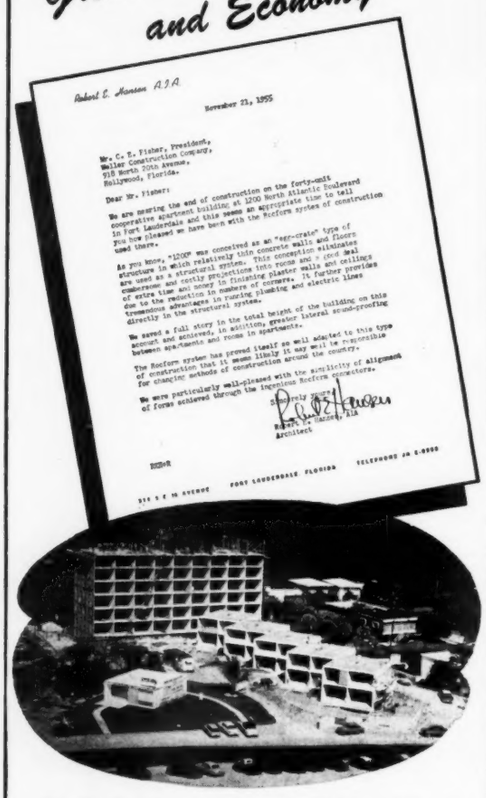

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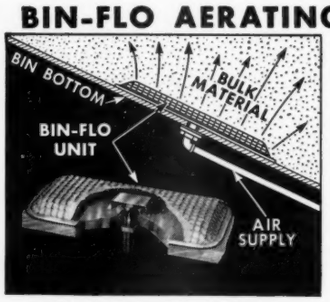

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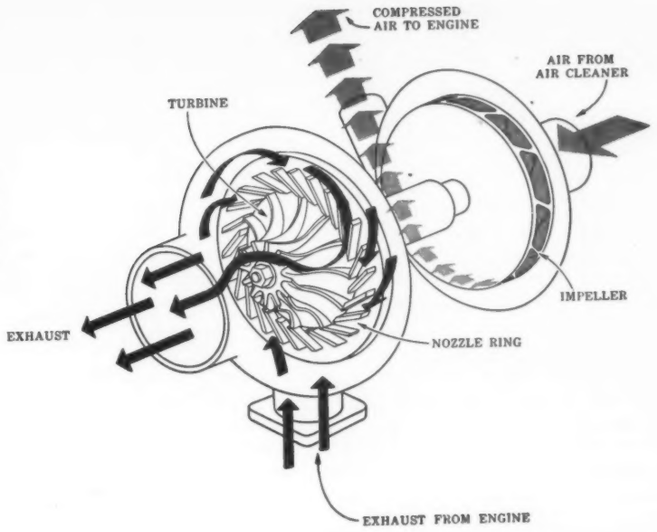
by the pressure of exhaust gases, is shaft-connected to the compressor impeller. The compressor is part of the engine air-intake system.

When the unit is driven by the exhaust turbine, the compression pressure within the intake manifold is increased, delivering more air into the cylinders. The turbine speed is directly influenced by the volume of gas flowing through the exhaust system. Three things are mainly responsible for the volume of exhaust gas and the pressure differential. First is the speed of the engine and its displacement, which establishes the cubic volume of air flowing through the exhaust system. The second is the fuel rack setting. The torque delivered by the engine is directly related to the fuel rack position, which is opened further as the external load increases. This means that a greater amount of fuel is delivered and the exhaust gas temperature and volume is higher. The third factor is the nozzle, inserted immediately ahead of the turbocharger. The exhaust gas pressure differential across the nozzle establishes the rate at which gas is discharged across the turbine blades. The greater the nozzle area—all other factors remaining equal—the slower the turbine speed.

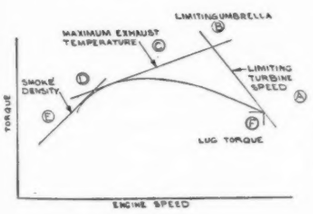


As exhaust gas is forced from the engine to the turbine, it strikes the nozzle ring and rotates the turbine wheel. A shaft connects the turbine wheel to a compressor impeller at the opposite end, and the compressor, turned by the turbine, draws outside air through the air cleaner and forces it into the cylinders.

Limitations

The torque rise characteristics of the engine fall within an umbrella bounded by three limits — turbocharger speed, smoke density, and exhaust gas temperature. Engine rack settings and governed speeds were sometimes changed without regard to the effect on the engine on other types of equipment, but on turbocharger engines, this can result in sustained exhaust temperature levels or turbocharger speeds that can prove detrimental to the turbocharger, the engine, or both.

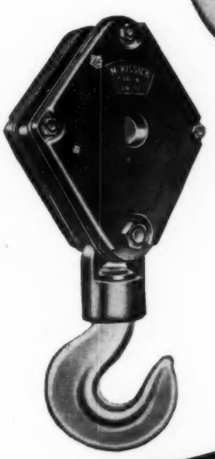
This sketch shows how continued operation at speeds and output above the umbrella boundaries will affect the turbocharger and engine:



At point A on the sketch, operation above the umbrella boundary will overspeed the turbocharger. At point B, operation will not only overspeed and overheat the turbocharger, but will cause overheating to occur in the engine pistons, cylinder head, and valves. At point C, pistons, cylinder head, and valves will be overheated. At point D, excessive smoke and overheating of pistons, cylinder head, and valves will result. At point E, there

(Continued on next page)

Scottie McBlock's a believer in "bein' prepared tae meet any situation."



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(Continued from preceding page)

will be excessive exhaust smoke. But if the turbocharger is equipped with a nozzle selected to operate at point A, it would permit the engine to "lug down" under normal operation and still remain within the umbrella.

Torque characteristics of an engine must be matched to the operating requirements of the vehicle it powers. Torque rise is important, but equally important is the speed at which the maximum lug torque is delivered. A proper balance must be maintained between the engine output and vehicle requirements. A sharp torque rise of the engine is essential from the operator's standpoint, for it simplifies his task of keeping the machine loaded. He simply operates the controls in response to variations in the sound of the exhaust.

The turbocharger on Caterpillar equipment has a sealed governor, fuel-pump housings, and nozzle ring to protect the engine against tampering. If the unit is tampered with, premature engine failure or the destruction of the supercharger may result. The safest procedure to follow is not to make any adjustment before obtaining complete information from the service department.

High-altitude operation

The effect of high-altitude operation on the turbocharger is a rise in turbine speed. The work capability of the turbine increases with the greater pressure differential now existing across the turbine wheel. The ceiling of the limiting turbine speed is reached at a lower horsepower output. Operation of the engine within safe limits calls for a reduced rack setting, just as is used on naturally aspirated engines. Failure to adjust the fuel rack for high-altitude operation may lower the efficiency of the equipment and increase fuel consumption. Another possible result—and one far more dangerous for personnel—is that it may lead to mechanical failure of the turbocharger.

THE END

Open new turnpike section

Approximately 37 miles of the northeastern extension of the Pennsylvania Turnpike was opened to traffic in the latter part of November.

The new section, added to the 360 miles now in operation, will connect with the present facility at an interchange near Plymouth Meeting and will extend northward to the Lehigh Valley interchange in the Allentown-Bethlehem-Easton area.

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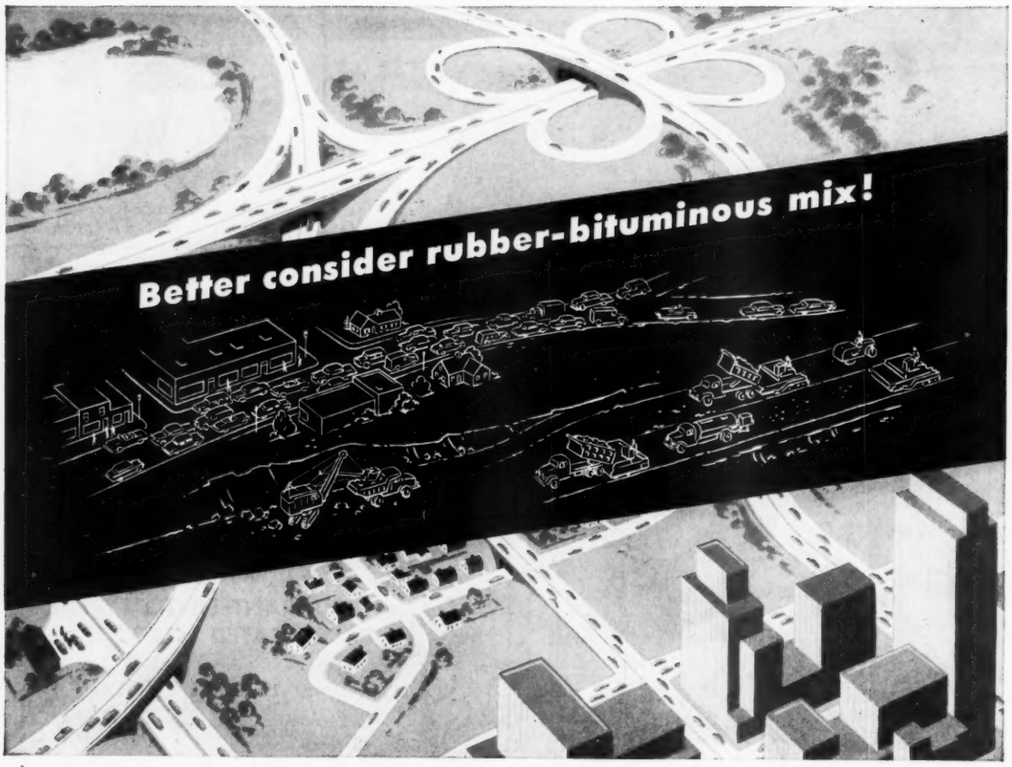

In the next ten years you should see some 20 million more cars on the road. This means bigger problems in maintenance, particularly if main streams of traffic have to be re-routed through your community. And one of the most efficient and economical methods of minimizing maintenance problems and increasing the load-carrying capacity of roads is to use Surfa-Sealz.

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High-capacity rigs hack road through rough terrain

Two of the Caterpillar DW21's used on the longer hauls are push-loaded by International TD-24 tractors. Many one-way hauls on this relocation project measured more than 3,400 feet.

A 1,478,000-cubic-yard earthmoving job in powder-dry dirt, clay layers, loose sedimentary material, and conglomerate in various stages of cementation was the toughest part of a $1,300,000 contract covering a 9-mile relocation of U. S. 91 between Glendale and Mesquite, Nev. Yet this work in the tough geological formation was completed on time—mainly because of the enormous digging and hauling capacity of the modern road-building equipment used on the project.

Constructed by Thorn Construction Co., Inc., Springville, Utah, and designed and supervised by the Nevada Department of Highways, this federal-aid job included drainage, subbase, 2½ inches of hot-mix asphalt paving, and the building of a 246-foot-long bridge across Toquop Wash.

The two-lane highway-reconstruction project is one of the last of those started 15 years ago on U. S. 91 east from Las Vegas. From Las Vegas to Mormon Mesa, about 75 miles away, the road has a good alignment. Only three years ago, the section from a high escarpment at Mormon Mesa to the town of Mesquite was relocated. Thorn's contract completed the ambitious relocation job started along the Virgin River, eliminating many miles of long-obsolete highway and giving the route long tangent sections, relatively flat vertical curves and, despite the mountainous terrain, gentle horizontal curves.

The biggest portion of the relocation job was the double-shift earthmoving work, which started on the west end of the project and moved toward Mesquite. One huge cut a third of the way toward Mesquite required 500,000 cubic yards of material to be moved to fills in long hauls. Most of the work throughout the length of the project involved long hauls; a large percentage of the material had to be moved a one-way distance of more than 3,400 feet. These longer runs were made by a fleet of five Caterpillar DW21's and two Caterpillar DW10's, which handled not only the bulk of the yardage but about 25,000 cubic yards of blasted rock.

For short hauls and auxiliary work, Thorn used 15 Caterpillar D8's as dozer Cats, sheepsfoot roller or ripping Cats, or as prime movers for the three LeTourneau and two Caterpillar scrapers which worked on easily dug material that required one-way

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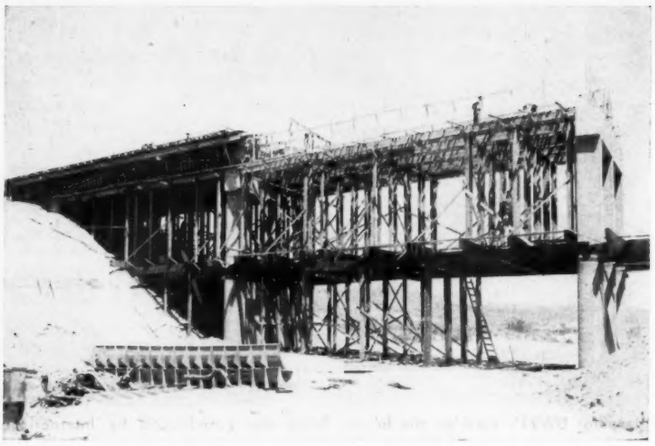

Underpinning, joists, and forms are in place for concrete-placing operations on the 246-foot-long Toquop Wash bridge. The long underpinning was required since the deck of the structure is about 50 feet above the bottom of the wash.

(*Continued from preceding page*)

hauls of not more than 800 feet. Two International TD-24 tractors were used exclusively for pusher work. The torque-transmitted power of these crawlers helped the scrapers to pick up full loads, but held tire spinning and wear on the scrapers' driving gears to a minimum.

Water problem

Pioneering cuts, done by the Caterpillar D8's, was difficult work. In many places, earth fills had to be started in the bottom of a deep wash and built gradually at low production until they had been well topped out over installations of Armco Multi-Plate culvert pipe up to 144 inches in diameter.

Despite winter rains and the presence of water deep in the soil, supplying water to the fills was one of the most difficult problems on this job. Compaction specifications called for 90 per cent of Standard AASHO testing, and this meant that 54,000,000 gallons of water had to be used to obtain the needed density.

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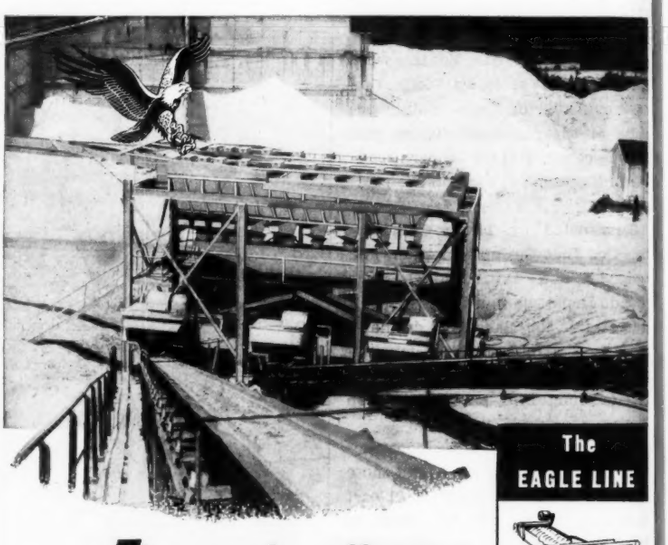

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◄ Water required on the job came from five pumping stations. Here a Euclid-drawn 5,000-gallon tanker takes water from one of the standpipes located along the route.

ing a station on Virgin River, where a Caterpillar diesel engine and a Fairbanks-Morse turbine pump combined to lift 600 gpm 175 feet through 8,000 linear feet of pipeline. This station delivered water to a temporary storage reservoir built by bulldozers on a high mesa, and a Wisconsin-driven Marlow pump and standpipe transferred water to trucks at this point. Other stations where standpipes were located were smaller than the Virgin River installation. Several stations used Wisconsin-driven Marlow centrifugal pumps, and one used a Worthington.

The large fleet of water-hauling equipment included two 3,000-gallon truck-mounted tanks and 5,000, 5,400, and 6,000-gallon tankers hooked to four Euclid prime movers. But maneuvering these big pieces of equipment on small-area fills was so difficult that several Chrysler industrial engine-driven fire pumps, a large supply of fire hose, and the necessary nozzles were brought in to hand spray a small-area fill being started. This worked very well, when cut areas were prerripped and sprinkled by the tankers.

As material was dumped by either scrapers or the DW21 fleet, the operators lifted the apron of a machine only enough to spread 6 inches of dirt. Three Caterpillar No. 12 motor graders assigned for dirt leveling, bank sloping, or fine-grading, kept the lift to a maximum thickness of 6 inches, except in places where large cobbles made this impossible. Bulldozers occasionally helped with this work. Since the material had been watered in the cut, on the fill, or at both places, about four passes of 5-foot-diameter sheepsfoot rollers were enough to develop the 90 per cent density required.

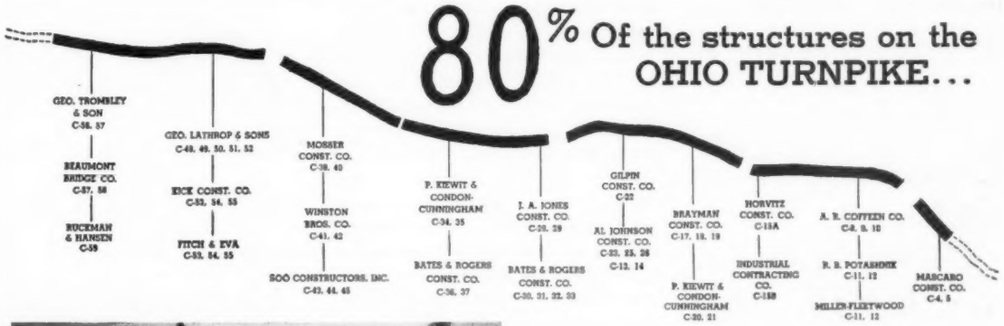
Some rock work

In the middle of one 102-foot cut, 25,000 cubic yards of heavily cemented conglomerate, too hard to rip and too unstable to drill, had to be shot. A Le Roi 500-cfm air compressor, a Gardner-Denver wagon drill, and two Ingersoll-Rand Jackhamers broke out the material, and also handled secondary shooting. The 2½-inch-diameter wagon-drill holes were put down in this formation on 5-foot centers by using Timken rock bits. Holes were loaded with 40 per cent Gold Medal and Giant explosives, usually of the bag type if ground water conditions permitted. Atlas Rockmaster delays from 0 to No. 5 were used to cut the side slopes accurately, and the 15 to 20-foot banks of broken material were loaded out by a Northwest 6 shovel as the two Ingersoll-Rand Jackhamer men worked just ahead of the rig to take care of secondary shooting.

Paving is easier

After the grade had been topped out to about a 40-foot width to accommodate a 44-foot-wide plant-mixed asphalt surface and wide shoulders along both sides of the roadway, from 4 to 9 inches of pit-run and 1-inch-minus crushed base-course material was put down on top of the subgrade. A Cedarapids Master Tandem rock plant crushed and screened the select material obtained from an unusually good crushing pit not too far from the center of the job. This pit contained a minimum of large cobbles and was well graded. Rock was trucked to the job, blade-

(*Continued on next page*)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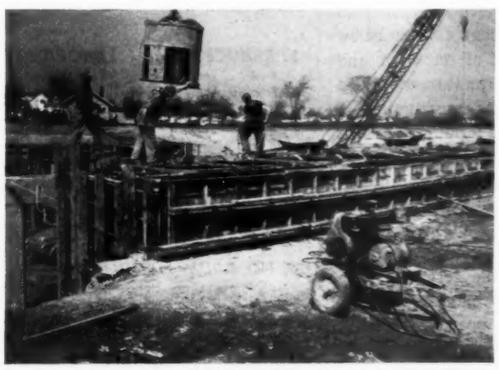

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(*Continued from preceding page*)

mixed by Caterpillar No. 12 motor graders, laid on the roadway, and rolled by a Galion 8-ton steel-wheel roller.

A Standard RB 4,000-pound asphalt plant turned out the hot-mix for the Barber-Greene finisher, and a 10 to 12-ton Buffalo-Springfield 3-axle tandem roller followed a Galion 10-ton roller to finish the surface. An application of emulsified asphalt, type RS-2, and a light cover of anti-skid chips completes the paving.

Some unusual work on bridge

The 246-foot-long Toquop Wash bridge, subcontracted to Young & Smith Construction Co., Salt Lake City, Utah, has a 30-foot clear roadway. With pedestrian walks, the deck is 35 feet wide. It is a standard T-beam structure with three spans measuring 66, 72, and 66 feet. The 22-foot cantilevered ends tie the last piers to earth approach abutments. Approximately 955 cubic yards of concrete went into the structure, which has concrete beams gracefully arched on the underside. Rounded concrete slope paving underneath the bridge will eliminate the danger of erosion of the stream bed during flash-flood periods.

Although the bridge work was largely conventional, there were several unusual features in its construction. One of these was due to the fact that the bottom of the wash is about 50 feet below the bridge deck. This made extremely long shoring and underpinning necessary. By digging a small trench for each row of timber shoring, placing approximately five inches of concrete in the bottom of the trench, and laying a mudsill for the support of the uprights, Victor L. Jackson, general superintendent for Young & Smith, eliminated all tendency for the shoring to tip or settle when loads were imposed from above.

The bottom of the wash contained good material for pier footings, making pile driving unnecessary. Footings were excavated about 15 feet below the normal bottom of the wash, and pier areas were unwatered by a Jaeger pump during construction.

The conventional forming consisted of ¾-inch plywood facing, nailed to 2×4 studs and stiffened when necessary by doubled 4×6 wales. Universal form rods, each capable of standing up under a 5,000-pound stress, were used to support the forms. At the bridge site, the contractor had a small carpenter shop equipped with a small Comet power saw and various Skil-Saws. Electric power for equipment working on the span was supplied by an International diesel-power gen-

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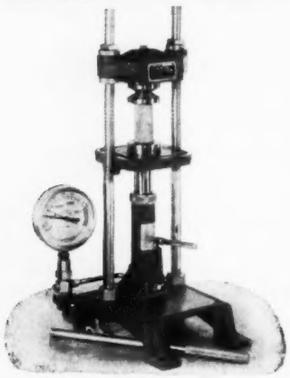

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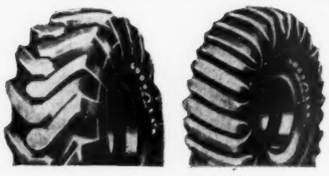

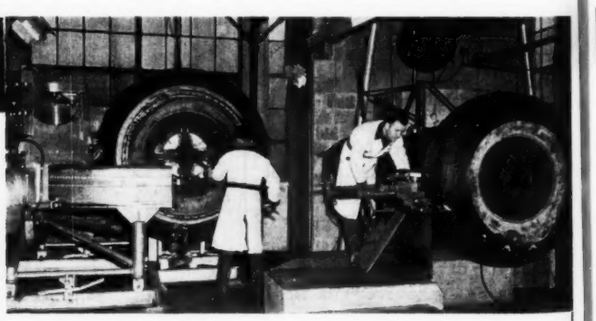

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...r sinks a powder hole on a ...d rock bench with an Inger-...Jackhamer which is supplied ...y a Le Roi 500-cfm compres-...,000-yard rock shooting as-...on this job was concentrated ...foot cut.

erator set and a small Homelite portable unit. The latter also supplied power for Homelite and Viber electric vibrators.

Concrete pours were made with the help of small portable concrete-mixing and placing equipment. Victor portland cement, sand, and dry aggregate were mxed by a small Jaeger 3-sack mixer, after the ingredients had been weighed by a Winslow proportioner. Concrete for pier shafts was dumped from the mixer to a Gar-Bro 1-yard transfer bucket handled by a Lorain crawler crane. For deck slabs and other flat work, concrete was dumped from the mixer to several Gar-Bro Georgia buggies which carried the material to its point of placement. High-cycle electric vibration by Homelite and Viber machines was used, and two gas-driven Mall vibrators were on hand in case of any interruption to the electric-power supply.

The concrete mix, which used Ayr-Trap air-entraining agent and 5½ bags of cement per cubic yard, was designed for a 3,000-pound compressive strength at 28 days. But actual results shown by test cylinders have always exceeded the specified maximum.

The job was designed and is being administered under the supervision of the Nevada Department of Highways, of which H. D. Mills is state highway engineer. J. D. Meacham is construction engineer in Carson City, and Charles Brown is resident engineer in the field.

F. H. Bradley was general superintendent for Thorn Construction Co. Assisting him were Arch Leavitt, general foreman; Arch Cameron, master mechanic; and Frank Worthen and Owen Van Sickle, foremen.

THE END

Lincoln remanufacturing gives full life to welders

Another service to the welding industry is being done by Lincoln Electric Co., Cleveland, Ohio, which is remanufacturing Lincoln welders turned in to the company, then returning them, with a full service life and standard new-machine guarantee, to the owner.

One of the firms using the Lincoln service to bring its older welders up to peak efficiency is the Perfection Steel Body Co., Galion, Ohio. This company is returning six 300-amp Lincoln welders to the Lincoln Electric Co. every week, and will continue the program until all its machines have been remanufactured.

The remanufacturing work is being done by the Linconditioning Division, which last year increased its output 45 per cent.

Honor system for tolls is paying off on parkway

Toll collections on the Garden State Parkway seem to show that people get more honest as the Christmas holidays approach. The toll road, which uses the honor system for paying tolls at six ramp areas, racked up a record of 88 per cent in one area in November. The average for all six areas was well over the 70 per cent mark and beat the 83 per cent made at one toll area in October. The percentage is figured by comparing cash receipts with the automatic treadle count of vehicles passing through the honor toll lanes.

California AGC chapter elects Pollock president

Gordon Pollock, of the George Pollock Co., Sacramento, Calif., was named president of the Northern California chapter of Associated General Contractors of America at the first meeting of the chapter's new board of directors. He had served as vice president during the past year.

Felix H. Siri of Piombo Construction Co., San Carlos, was made vice president; Millen Simpson, of Ball & Simpson, Berkeley, treasurer; and Frank W. Callahan, chapter manager and secretary. Outgoing president Ernest L. Clements was made a member of the organization's advisory board, which includes A. E. Holt, H. C. Maginn, Harold O. Parish, and Dallas Young.

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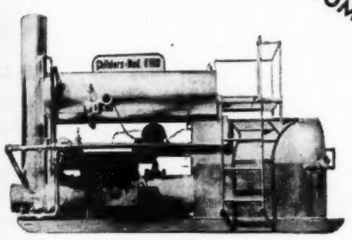

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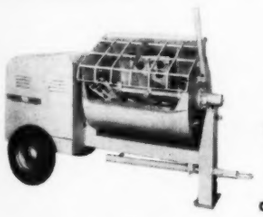

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Plaster and mortar mixers are made in 4, 6, and 8 cubic foot sizes with Briggs and Stratton engines or electric motors. All gasoline driven machines have power throw-outs with starting switches on all electric units. A special shaft seal protects bearings. Rubber blades are standard on all models.

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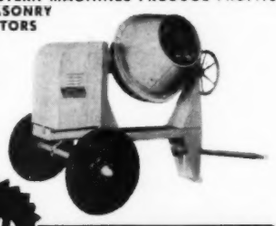
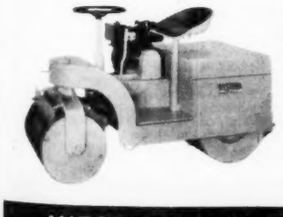
Concrete Mixers — 3½ cu. ft. capacity, tilting type with either side discharge or end discharge. Extra large drum size with fast, thorough mixing action, Timken bearings throughout, powered with Briggs and Stratton engine or electric motor.





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Operating near the face of a big cut, a Caterpillar No. 80 scraper is push-loaded by a Caterpillar D8 to bring the roadway to grade. The Ateco ripper mounted on the rear of the tractor gave good service in shale and seamy formations.

Processing technique makes subbase material acceptable

Plasticity index of a mix is brought from 9 to 5 by wasting No. 4 fraction and using sand for blending

A method of handling material from a marginal rock pit so that it would be acceptable for subbase construction has worked out well for S. Birch & Sons Construction Co., Great Falls, Mont., contractor on a 3½-mile stretch of U. S. 30 near Rawlins, Mont. In this area, good natural rock pits are scarce. And since the one selected for use on this job required only minimum hauls, Wyoming State Highway engineers were anxious to salvage the material, which had fines with a plasticity index as high as 9—three points over the maximum that are allowed by specifications.

Rejection of about half the minus No. 4 fraction at the rock plant, coupled with a blending technique developed by the contractor, effectively reduced the PI of the base material to 5. The blending operation, done after crushed material was laid in windrows on the roadway, consisted of hauling fine sand to the site, then mixing it in the windrow already laid out.

Birch's contract called for grading, subbase work, and the application of an asphalt prime coat on the road—a two-lane highway with truck lanes on hills making its width vary from 48 to 62 feet. Subgrade requirements called for compaction to about 92 per cent of Modified AASHO density. Over

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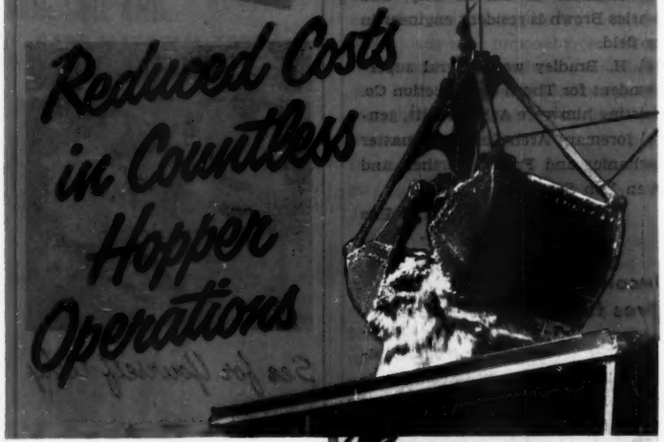

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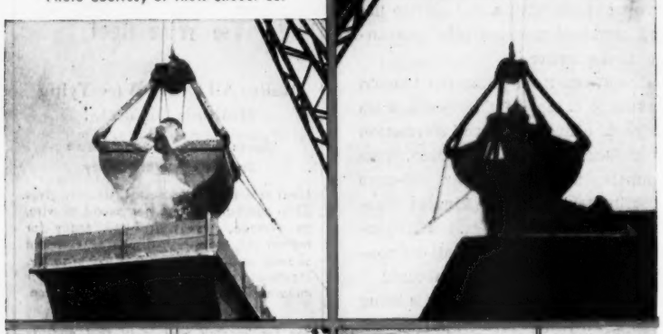

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- Applicable to any standard dump truck.

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the 5 to 9 inches of pit-run material is a 2-inch-minus base course compacted to 3 inches and a 5½ to 6½-inch tapered layer of 1-inch-minus crushed material. Both classes of subbase material were above specification limits for PI. These were the gradation specifications for the two plant-sized grades of material:

Size screen	Per cent passing 2-inch-minus	Per cent passing 1-inch-minus
2-inch	100	....
1-inch	60–90	100
¾-inch	....	75–100
No. 4	30–60	40– 75
No. 10	....	30– 60
No. 200	0–15	3– 15

PI: not greater than 6 for both materials

Even while the Birch firm was grappling with this problem, it was tackling a more pressing job—grading for the road. Most of the trouble on this section of the work was caused by intruded dikes of sand rock in the biggest cuts. Though the company expected most of the material to dig easily when the job was started, a LeTourneau K30 rooter and a Caterpillar D8 with an Ateco rear-mounted ripper were brought to the site. These machines were effective on shale and some of the more seamy broken formations, but a massive intrusion of hard sandstone required drilling.

Difficult work

A Chicago Pneumatic 500-cfm compressor and two Chicago Pneumatic wagon drills, with a good supply of 20-foot steel and Ingersoll-Rand Carset drill bits up to 3½ inches in diameter, were assigned to this job. Sometimes a machine penetrated about 12 feet through solid rock to material soft enough for scrapers to dig. At other times, drilling was extremely tough. This meant that drillers had to work out a wide range of hole patterns, depending on the hardness and thickness of the rock dikes. The spotty nature of the rock also precluded the use of large powder shots. Not more than a ton of powder was used in a shot.

Both bag and gelatin-type Du Pont powder was used in column-loading the holes. Sometimes, stemming was used both below and above the powder charge in order to confine the explosive effect within the rock.

The biggest cut—31 feet deep, 165 feet wide, and with tough rock dikes at irregular intervals—was one of the most difficult Birch has done recently.

The firm's grading equipment on this job included two Caterpillar 20-

(*Continued on next page*)

For more facts, circle No. 423→

Loaded with sand and rock and pulled by a Minneapolis-Moline rubber-tire tractor, a Bros pneumatic roller compacts the base course to 95 per cent density by continuous passes.

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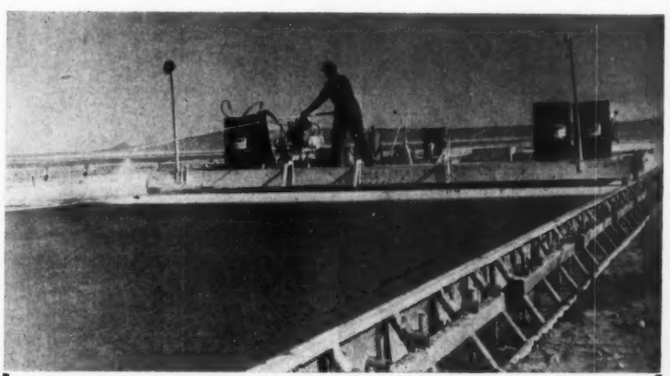

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PROCESS BITUMINOUS MIXES

One of the fleet of 15 haul trucks loads under the surge bin of the Cedarapids Master tandem crusher. Driven by a Murphy diesel, the plant has a 10 x 36 jaw crusher and a set of 40 x 22 rolls.

(*Continued from preceding page*)

yard DW21's, a LaPlant Choate 16-yard rubber-tire unit, and an Allis-Chalmers 16-yard motor scraper. Short-haul work—and this was the type general superintendent Larry Mahan tried to do most of the time—was done by two Caterpillar No. 80 scrapers and a No. 70 scraper. Of ten tractors on the job, seven were D8's and three were Allis-Chalmers HD-20's. Two of the HD-20's were equipped with Gar Wood pusher blocks, while one was equipped with a Gar Wood cable-controlled dozer blade. One of the D8's with an Ateco rear-mounted ripper helped loosen the formation ahead of loading work.

The dirt portion of the more than 522,000-cubic-yard grading job consisted of weathered shale, sand, and sandy gravel. Most of the dirt was topsoil over the rock dikes. All this material was graded around balance points, and as much of it as possible was moved by scrapers. When hauls lengthened and tractor-drawn scrapers were no longer economical to operate, the DW21's and allied equipment took over, completing the fills.

Dirt was laid in 6-inch lifts, or as close to that as possible, and compacted up to 80 per cent of required density by loaded equipment taking different routes across the fills. After this, compaction was done by two Southwest heavy-duty sheepsfoot rollers, ballasted to about 550-psi of foot surface. Watering equipment used in compaction included a Ford F-800 tandem unit, carrying 5,000 gallons, an International L-190 with 3,000 gallons, and GMC and Ford F-7 trucks, both rated at 2,100 gallons.

Some dirt spreading, bank sloping and other incidental work was handled by two Caterpillar No. 12 motor graders.

Necessity plays a role

Though early investigation indicated that the rock pit might yield acceptable material that would not need blending, the federal-aid contract had been started when it became apparent that this material had a PI above specifications. At this time it was difficult to negotiate a change order permitting other material, involving longer hauls, to be used.

Investigation then showed that the material would prove satisfactory if about half the minus No. 4 fraction from the pit were wasted, and blow sand with a zero PI blended with material turned out by the Cedarapids Master Tandem crushing and screening plant.

The plant, driven by a Murphy diesel through a direct-connected drive, uses a 10×36 jaw crusher, a set of 40×22 rolls and various sizing screens that classify the material passing through. The minus No. 4 fraction went through a No. 4 screen on the lower deck to an adjustable splitter gate that was set to discard objectionable fines over a conveyor. At one time, the plant was turning out a pay quantity of 170 tons of material per hour and about 20 tons of material was being wasted by the reject conveyor per hour. This was dozed off to a corner of the pit.

To keep the Master tandem plant producing, raw material was hauled in by a DW21 push-loaded by an Allis-Chalmers HD-20. Loads were dumped close to the feeder trap, and a second HD-20 with a Gar Wood dozer shoved material to the trap. Material entering the plant passed over a 2-inch scalping screen deck that routed large cobbles to the 1036 jaw crusher.

A second deck in the plant, fitted with 1-inch mesh, separated the rock fraction between 1 and 2 inches, and routed this material to the rolls. The through product from the jaw also was routed in closed circuit to the rolls and screen deck to produce an acceptable finished product.

A 25-yard surge bin a short distance from the plant proper took the output

Need 3-ton batches of bituminous concrete?
. . . 150 tons per hour of base course mix?
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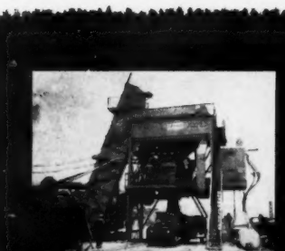
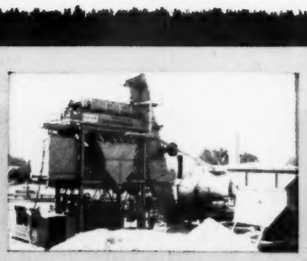


Model G60 produces 3 or more tons per batch, turns out 180 tons of asphaltic concrete per hour. Every new design feature known is incorporated in this plant.

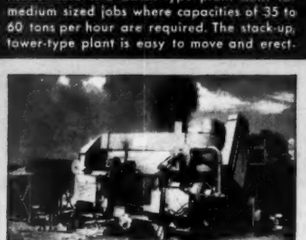


Model G40 is just like the big G60 except for size and capacity. It's designed for jobs requiring around 120 tons per hour average.

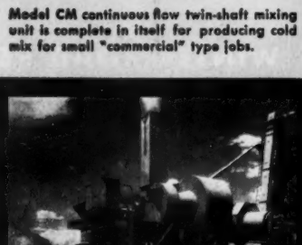
Model H15 is a batch type plant built for medium sized jobs where capacities of 35 to 60 tons per hour are required. The stack-up, tower-type plant is easy to move and erect.

Model CM continuous flow twin-shaft mixing unit is complete in itself for producing cold mix for small "commercial" type jobs.

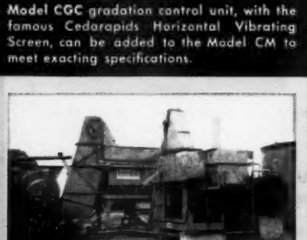
Model CGC gradation control unit, with the famous Cedarapids Horizontal Vibrating Screen, can be added to the Model CM to meet exacting specifications.



Model 3612 or 4816 "Packaged" Drier is used with the CM or H15 plant to produce hot mix or high type bituminous concrete.



Dry Skimmer Type Dust Collector is designed for compact, simplified installation, increased efficiency and low maintenance.



Master Plant continuous flow twin-shaft mixing plant, incorporating gradation control unit and drier, produces up to 200 tons of specification mix per hour.

Charging Hoppers and Feeders, available in various sizes and styles, assure a steady flow of material into all types of bituminous mixing plants. Ruggedly built for long life.

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of material from a stacker conveyor, which was driven directly by a driveshaft in the plant.

The high PI of the fine fraction of material was especially apparent when material was damp as it passed through the screen decks into a receiving bin. In this case, the bin tended to cake badly. Fortunately, the raw material was fairly dry most of the time, and the bin had to be cleaned only once in each shift. The material was not abrasive on crushers or screens, and regular Texaco lubrication, coupled with reasonable maintenance, kept the plant running.

Blending subbase

Up to 15 dump trucks, some rented and some company owned, hauled the product away from the crushing plant. The 2-inch-minus base course, 3 inches thick, was dumped and spread in one lift. The 1-inch-minus material, about 5½ inches thick at the highway center line and 6½ inches thick at the edges, was laid in two lifts. In both cases the processing methods were similar.

As a windrow of granular material was laid (checked by tape), one of the No. 12 motor graders moved up to flatten the top of the loads. Other trucks then moved in with about 15 per cent-by-volume of fine blow sand, obtained from a pit about five miles from one end of the job. Trucks, loaded at the pit by a Cat D2 with a Traxcavator front-end loader, moved along the roadway, placing the sand in a thin, uniform lift by dumping it through cracked tail gates of the raised dump bodies.

Orthodox wetting methods failed on this material at first, causing the No. 4 material still in the mix to roll into a ball. But through trial and error, a method of applying moisture was found.

After the sand had been dumped, both motor graders roadmixed the entire windrow, then cut small slices of material from the windrow toe, drifting it out over the roadbed. Lifts as thin as 1½ inches were common.

One or more water trucks, working close to the graders, sprinkled the material with the necessary moisture. A Bros straight-wheel pneumatic roller, well ballasted with sand and rock, and pulled by a rubber-tire Minneapolis-Moline tractor, made repeated rolls to develop about 95 per cent of optimum compaction in the material. On the upper subbase layer, a second windrow had to be dumped and processed in the same way.

The good results obtained by Birch in controlling the PI of the subbase allowed him to complete his work on the road by applying a prime coat of MC-O asphalt by pressure distributor. This will hold the base until plant-mix surfacing is done under a separate contract.

Personnel

This project was designed under the supervision of John A. Atkins, district engineer of District 2 of the Wyoming State Highway Department. Charles E. Gattis, project engineer at Rawlins, was directly assigned to the job, and Charles Hornbeck was chief inspector for the state. Field supervision for the contractor was done by general superintendent Larry Mahan.

THE END

Safway promotes Perret

Arthur L. Perret has been promoted to the new post of sales manager, Shoring Division of Safway Steel Products, Inc., Milwaukee, Wis., maker of telescoping steel shores, sectional scaffolding, and other equipment of that nature used in the construction industry.

Perret, with Safway since 1950, was formerly eastern regional manager for the firm. He was instrumental in designing the Safway Shore, introduced in 1952.

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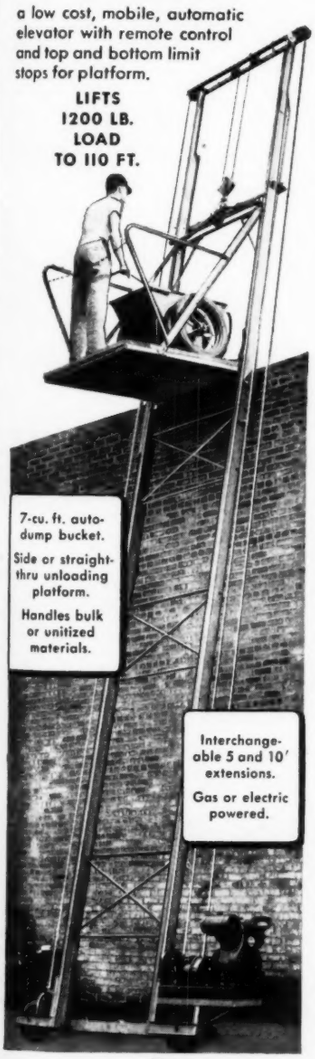
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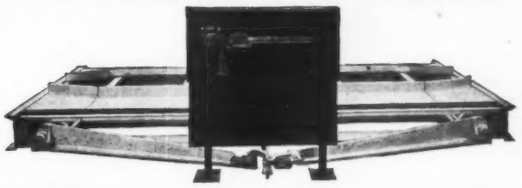

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MODEL HTD-500

McConnaughay MULTI-PUG ASPHALT MIXERS OFFER MORE ADVANTAGES!

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McConnaughay Mixers are the result of more than *25 years' active experience* in building mixing equipment and in all phases of the paving industry. Extensive laboratory and field testing assure buyers that these mixers will do the job in practice as well as in theory. Hundreds of the two mixers illustrated are *in active service in 46 States, Alaska, Canada, South America, Europe and Africa.* Designed for fast, economical operation in any climate in any season... they do the job wherever located. That's why customers are our best salesmen. Write for name of user nearest you.

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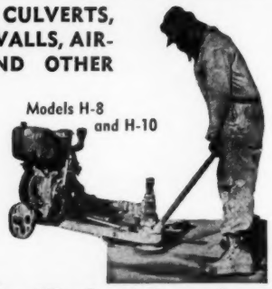

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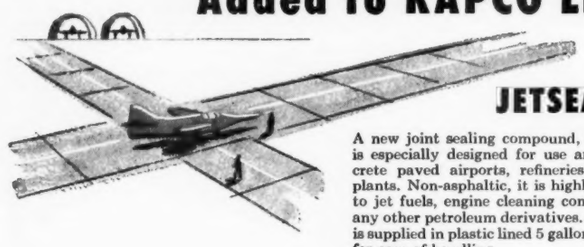
New PAVING PRODUCTS Added to KAPCO Line!

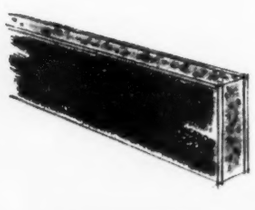


JETSEAL

A new joint sealing compound, JETSEAL is especially designed for use around concrete paved airports, refineries and bulk plants. Non-asphaltic, it is highly resistant to jet fuels, engine cleaning compounds or any other petroleum derivatives. JETSEAL is supplied in plastic lined 5 gallon steel pails for ease of handling.

KAPSEAL

This new Keystone development is an amazing rubberized compound for sealing cracks and sawed joints in concrete or bituminous—resurfaced pavement. Kapseal Crack Filler is an ideal maintenance sealer and is easily applied with your present equipment. It will not become brittle and crack, offers excellent adhesion to all pavements and maintains absolute bond through cycles of expansion and contraction.



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KAPCORK is a non-extruding, premolded expansion joint developed for all highway and airport work. It consists of a composition of asphalt and new, granulated cork formed between asphalt saturated paper. KAPCORK features recovery of 80% of original thickness after compression, low moisture absorption, and ease of handling without breakage.

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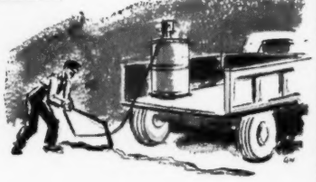
KAPCOLD JOINT SEALER is compounded from rubber and asphalt especially for sealing concrete joints. It is applied, under pressure, direct from the drum into joints and cracks without heating or mixing to form a positive bond that remains flexible at high and low temperatures assuring an effective seal through years of expansion and contraction.



Other KAPCO Products

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KEYSTONE ASPHALT PRODUCTS COMPANY
Division of American-Marietta Company
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A Manitowoc crane (left) works with another rig to set a girder in place on the 900-foot bridge. All welding was done manually in the yard of the J. K. Welding Co., Yonkers, N. Y., with low-hydrogen electrodes.

Shop weld huge girders for thruway bridge

by G. N. BULL, district engineer
The Lincoln Electric Co.

Built-up, all-welded construction has given unusual symmetry to the huge cantilever girders of the 900-foot bridge carrying the New York State Thruway over the tracks of the Erie Railroad at Suffern. The two expressway lanes are supported on 14 girders, each weighing 55 tons, and the 900-foot length of the bridge is divided into six spans. In all, 84 girders are used, the longest being 175 feet.

The deepest section of the cantilever beam, which carries the full load of the girder onto a reinforced-concrete pier, is 11 feet and tapers to 4 feet 8 inches at the ends. The cantilever ends are provided with bearing surfaces to support the suspended span girders over the railroad tracks.

Developed by the New York Department of Public Works, the design represents an estimated 50 per cent saving over the weight of steel required by a riveted girder of constant section. Welding provided the needed design flexibility since the bridge is on both a slope and a curve and is banked.

All welding, done manually in the

the Remarkable

Anco LOCK NUT

- cannot be loosened by vibration
- only ONE nut necessary
- easier to install

Galvanized ANCO NUTS save time and money in installation . . . offer unusual strength and dependability. They're practically standard equipment for power line clamps, cross-arm braces, insulators . . . radio and TV transmission towers.

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Write for samples, complete information, and prices.

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This span, to include 14 girders, will carry the two-lane thruway over the Erie Railroad tracks near Suffern, N. Y. Entirely shop welded, the structural elements were shipped to the site by rail and barge.

"He'll find his severance pay in his pocket when he stops running."

shop of the J. K. Welding Co., Yonkers, N. Y., started with the laying and cutting of web plates for shape and size on level bays in the shop yard. Welding was done with low-hydrogen electrodes—AWS class E-6016—at reverse polarity, specifically the Lincoln Electric LH-70 rod.

Vertical stiffeners were tacked into place and fully welded before the flange plates were attached and welded with a continuous fillet. Corners of the stiffeners were coped so that the flange welds ran through them without interruption.

Web plating, from 3/16 to 3/8 inch thick, was shipped from the mills in maximum lengths of 84 feet. Butt welding was used to obtain uniform full-girder length. Flange plates, 2 feet wide, varied in thickness according to their location on the girder, reaching a thickness of 3¼ inches at some points. These flanges were butt welded, too, since their maximum length was also 84 feet. With all the butt joints of the double-V type, most of the welding was done in a flat or horizontal position.

On the exposed face of the outside or fascia girders, vertical stiffeners were eliminated in favor of the curved longitudinal stiffener strips which followed the camber of the lower flange. These were more graceful, and the change was made solely in the interest of appearance.

Maintaining alignment and camber as well as checking and controlling distortion were major problems in fabricating the girders since the continuous-type fillet welds tended to increase internal stresses and warping. Special jigs, jacking rigs, filler blocks, and weights were used in the assembly. A crew of 100 riggers and welders worked in the shop at peak periods.

Field welding was used to connect frames and cross bracing which were attached to brackets on the girder webs. Bearings were field welded to girders with low-hydrogen electrodes, supplied with current by 300-amp engine-driven welding generators.

THE END

A bill to impose a milage tax on trucks will be sponsored at the next session of the Massachusetts Legislature by the state AAA.

Cables in concrete "I" beam are stressed to pre-determined tension by 60-ton Simplex "Jenny" Hydraulic Puller equipped with pressure indicating gauge.

Hydraulic Puller Prestresses Concrete Faster, Safer, Easier

"Center-Hole" pulling, an exclusive feature in Simplex Pullers, has simplified prestressing jobs, according to concrete construction men. The "Center-Hole" construction of the Puller, they explain, permits tensioning cables or rods to be drawn through the center of the tubular ram. This eliminates torque, dangerous off-center pressures and complicated back-up devices—actually makes pulling 75% easier. The Simplex "Jenny," illustrated above, is a self-contained unit which serves as its own back-up or can be used with a simple chair, reducing set-up time. Simplex "Center-Hole" Pullers are available in capacities from 30 to 100-tons and in self-contained or remote controlled units. They may also be used as powerful hydraulic jacks and presses as well as pullers.

SIMPLEX "RE-MO-TROL"—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

FREE BULLETIN SHOWS HOW

Illustrates application of all models of Simplex Hydraulic "Jenny" and "Re-Mo-Trol" Pullers for prestressing concrete and for other construction uses. Write for copy of Hydraulic 53.

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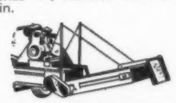

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Weather charts

The weather outlook for February

The two accompanying maps, prepared for CONTRACTORS AND ENGINEERS by Weather Corp. of America, indicate the anticipated number of days with rainfall and the average number of days with temperatures of 32 degrees or lower.

Areas indicated as "dry", in Chart 1, will more than likely have fewer than 6 days of rainfall during February; "medium" areas will average between 6 and 12 rainy days; and 12 or more days of rain can be expected in "wet" areas. In Chart 2, those sections marked "warm" will have fewer than 8 days below-freezing; "medium" areas will have between 8 and 16 days with freezing temperatures; and the "cold" areas will average more than 16 days with temperatures that will fall below 32 degrees.

Although these maps show only average conditions and are not intended as specific forecasts, contractors in St. Louis, Omaha, and Minneapolis may anticipate more working days during February than those in Pittsburgh or Detroit. Western Missouri, judging by the charts, will probably have more working days than western Indiana.

Since these are average charts, they may be used for any year. Further information on the use of the charts or on the applied uses of climatology may be obtained by writing to the Weather Corp. of America, 39 Broadway, New York 6, N. Y., or Railway Exchange Building, St. Louis 1, Mo.

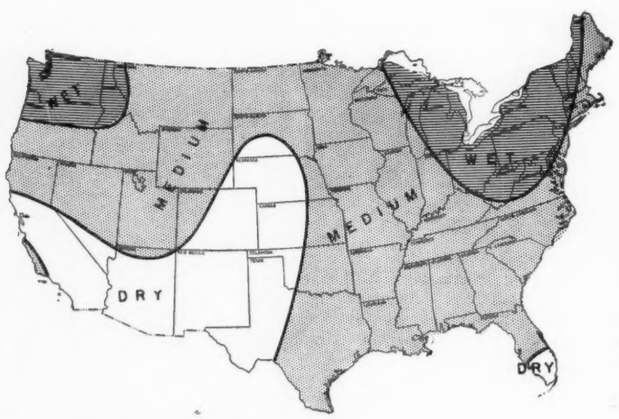

Chart 1. Precipitation range for February.

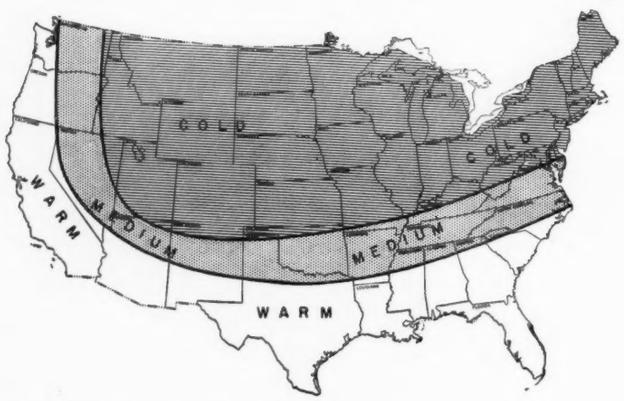

Chart 2. Temperature range for February.

Spain has best buildings; German designs monotonous

The most modern, functional, and beautiful buildings being constructed today are going up in Spain, according to Adolf Lancken Muller, president of Halsey, McCormack & Helmer, New York, N. Y., a firm noted for its design of banks. Muller, who made a six-week tour of Spain following a trip through West Germany, feels the most outstanding new office building in Madrid is a 27-story-high structure with a rooftop restaurant and swimming pool.

West Germany, according to Muller, is producing large office buildings, similar to those in the U. S., with little variety or distinction. In this country, he said, economy has made it necessary to use a great deal of artificial stone in construction. The chief metal used is aluminum, and it is often finished to look like bronze.

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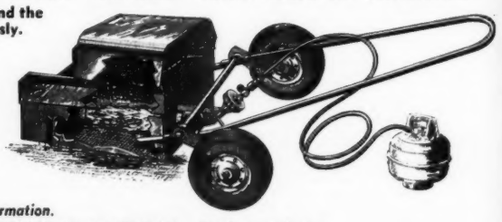

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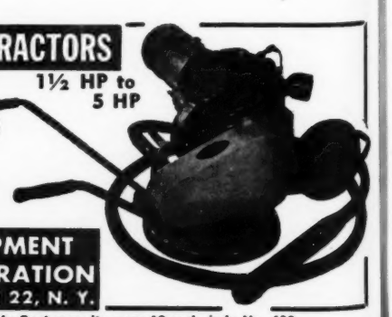

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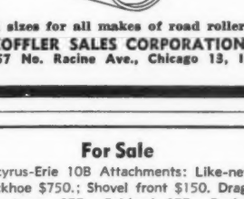

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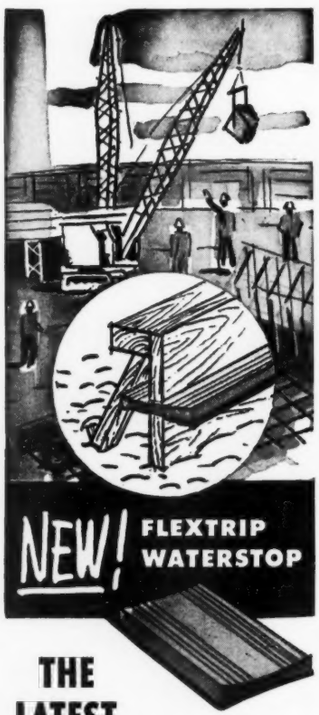

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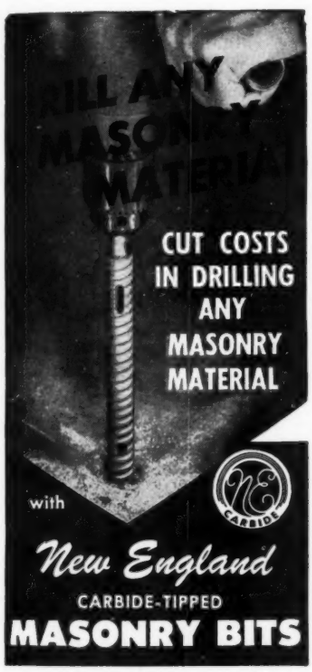

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Model_____ No. tracks per belt_____

Width of grouser_____

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COMPANY_____

ADDRESS_____

CITY_____ ZONE_____

STATE_____

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Surveying washington

by HUBERT KELLEY, JR.

Of all the **highway bills** that failed to pass Congress last year, the only one with much life in it as this session opens is that sponsored by Sen. Albert Gore, (D. Tenn.)

Senate majority leader Lyndon B. Johnson, (D. Tex.) has made a road bill "similar to the Gore bill" one of the thirteen objectives in the Democrats' 1956 legislative program. As for highway financing, the controversial issue that stalled legislation last year, Sen. Johnson says he hopes that can be handled separately as part of the general tax program. Most highway users share this hope with the senator, wanting the House Ways and Means Committee to study highway financing while the Roads Committee sticks to authorization problems.

The Gore bill, it may be recalled, underwent many changes in form before it finally passed the senate last session. In its final version, it authorized $7.75 billion for the interstate system, $2 billion for primary roads, $1.5 billion for secondary roads, and $1 billion for urban highways. All this was to be spent over a five-year period.

It also called for federal-state participation in paying for the 40,000-mile interstate system at a ratio of 90 to 10, and proposed taking the annual highway appropriations out of general funds.

Although the Administration bitterly opposed the Gore bill in favor of the Clay committee's bond-financing plan, many key Republican leaders have softened their attitude since Congress recessed.

Last month, Sen. Edward Martin, (R., Penn.) who introduced the Administration's road bill, promised to give his support to "any reasonable compromise that will assure prompt action." In spite of his backing of the bond-financing plan, Sen. Martin told a meeting of state highway officials that "for half a century I have favored the pay-as-you-go principle." He pointed out that "many fine, conservative people" stand against the bond program, and he added that the prospect of a balanced budget means that highway funds can be taken from the general fund as long as taxes are not cut.

Sen. Martin declared that he is confident Congress will clear the way this session for completion of the interstate system. If the current spirit of compromise persists, he may be right.

Whether Congress takes action or not, the U. S. is expected to **hike highway spending** about a half billion dollars this year, bringing the total to a record high of $4.6 billion. This is the joint estimate of the Department of Commerce and Labor, and it is based largely on prospects of more federal aid and increased toll-road construction.

Other sorely needed construction includes sewer and water facilities, which are expected to rise 11 per cent from 1955's $1.08 billion to $1.20 billion. Outlays for public school construction should break another record, totaling $2.7 billion in 1956.

In spite of these record figures, the departments make it clear that school, highway, and sewer construction will fall well below our national needs. The big backlog we have now will get bigger still.

The chief of the Housing and Home Finance Agency has delivered a grave warning on the state of the **nation's construction needs**—particularly in our cities.

In a recent address, Albert M. Cole asserted that our building problems will not be solved alone by adding

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more streets, sewers, houses and schools to our cities. Unless such improvements are made according to a comprehensive plan, he cautioned, they will be wasted.

A city that fails to develop a master plan for its future within the next five years—and get started on it—will face municipal bankruptcy in 1965, Cole said. Americans have got to realize, he continued, that their historic city pattern is obsolete and that what he called "the urban pattern" must be gradually reshaped on an area-wide basis.

Cole thinks our cities have made an encouraging start, for 320 redevelopment operations are now in progress in more than 200 communities. The first step, he believes, must be to raise the level of local housing.

Another kind of engineering shortage worries the Atomic Energy Commission—the **shortage of engineers.** The Russians, warns Rear Adm. H. G. Rickover, chief of the AEC's Naval Reactors Branch, are catching up with U. S. engineers and scientists, and will probably pass us soon.

Much of this country's failure to produce enough engineers, says Adm. Rickover, must be blamed on the public schools. Nearly half of our high schools, he has stated, offer little or no instruction in physics, chemistry, or mathematics beyond first-year algebra. Many teachers do not know how to teach math, he reports, and school children become discouraged easily.

As a partial solution to the teaching shortage on high school and college levels, Adm. Rickover suggests giving engineers sabbatical leave from industry to teach in our schools.

"It is not farfetched," he says, "to expect industry to help carry its social obligation." Industry is short about 40,000 engineers today, he added, and will require a minimum of 30,000 new engineers every year for some time to come.

During the five-week-long **"study" of General Motors** recently, Raymond Q. Armington, general manager of GM's Euclid Division, testified that "it would be fine" if small firms like his could have remained independent and still do big things.

But the fact remains, Armington told the O'Mahoney subcommittee, that "Euclid has just grown into a market and an industry that required the finance, resources, and facilities of a larger organization."

Only a large manufacturer can develop new earthmoving machinery, the witness said, giving the large Euclid crawler tractor as an example. "It can be presumed that it has stimulated all three major crawler-tractor manufacturers to produce heavier, more powerful tractors," Armington testified.

If GM had not purchased his firm in 1953, he added, Euclid could not have hoped to continue to make real advances in this fast-growing industry."

Sen. Lyndon Johnson has announced that Democrats will push for a number of **big federal water-power programs** during the current session, including a "higher dam" at Hell's Canyon on the Snake River. The Administration favors dams built by private enterprise.

Other projects Sen. Johnson says he will back are: The Frying Pan Arkansas project, the Washita-Oklahoma project, the Ventura, Calif., project, New England Development, and a survey of the potentials of Maine's Passamoquoddy River.

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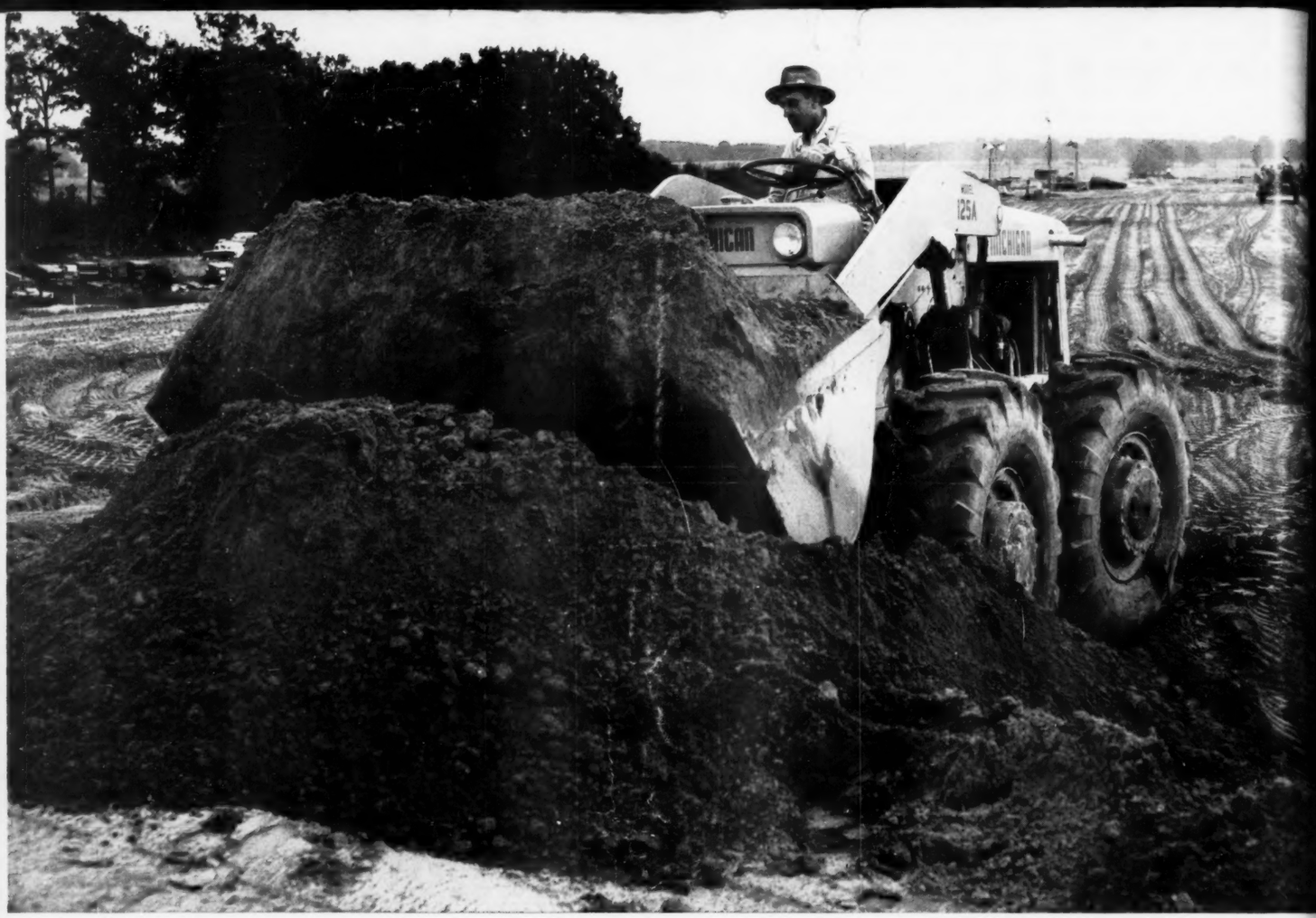

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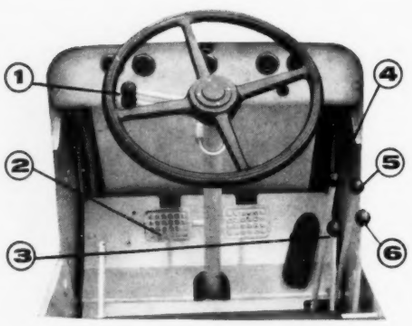

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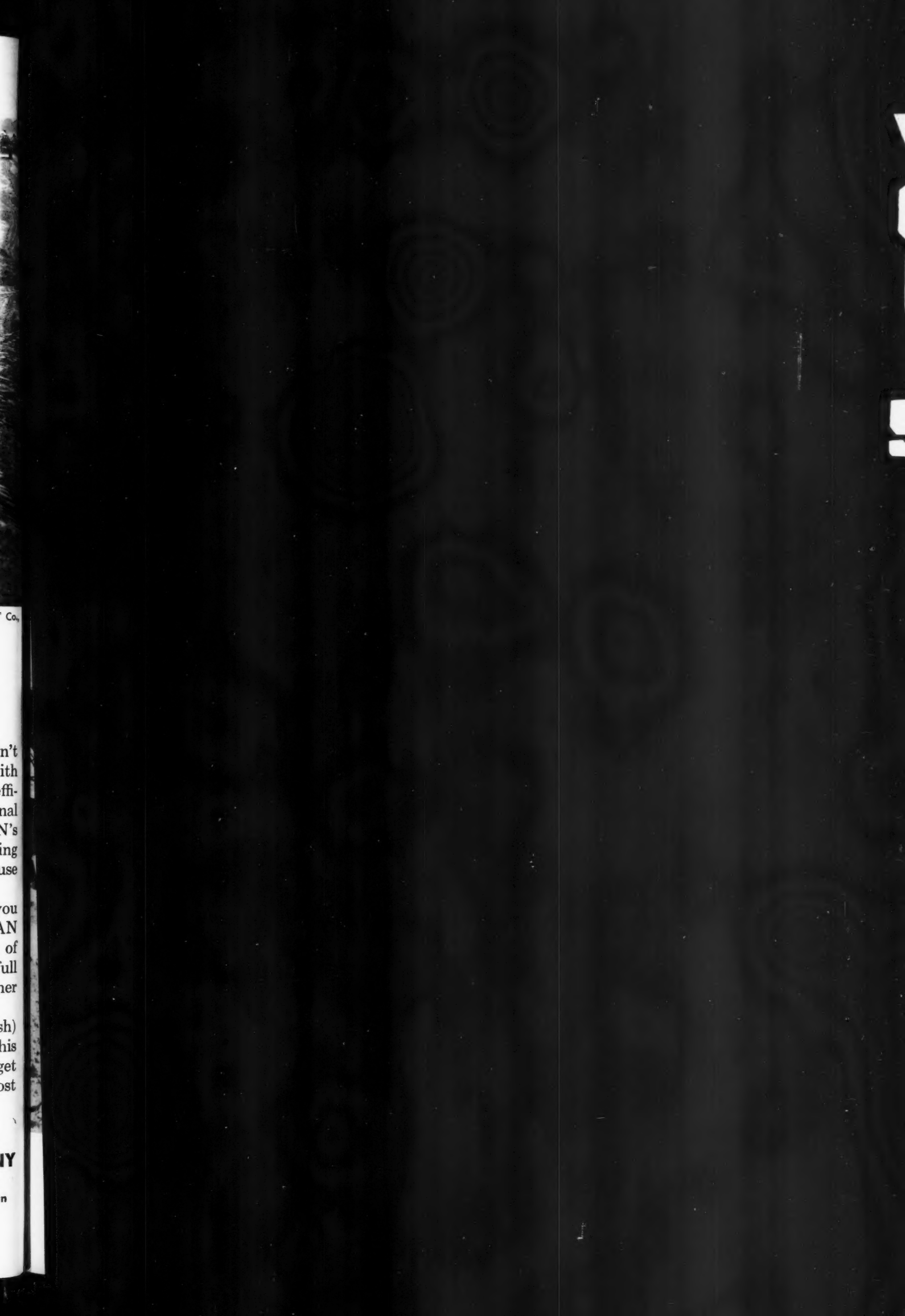
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